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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY.



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VOL. XIV.

SESSION 1869-70.

Nos. I. to V.

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PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Issued February 25th, 1870.]

SESSION 1869-70.

First Meeting, November 8th, 1869.

Sir RODERICK I. MURCHISON, Bart., K.C.B., President, in the Chair.

Elections.—*Francis Barchard, Esq.; William Samuel Burton, Esq.; Samuel Woolcott Browne, Esq.; Dr. Cayley; Rev. Tupper Carey; Guillaume F. Costa, Esq.; Robert Campbell, Esq., J.P.; Dr. Hananel De Leon; John Harris, Esq.; James MacAlister Hall, Esq.; Robert Matthews Inman, Esq.; George L. Kemp, Esq.; Captain Thomas Lewin* (Bengal Staff Corps); *Francis K. Munton, Esq.; John Piggot, Esq., Jun.; Lieut.-Col. William Fitzwilliam Read; Thomas Rondell, Esq.; Colonel T. R. Stewart* (Bombay Army); *B. Charles Stephenson, Esq.; Robert Salmond, Esq.; George N. Taylor, Esq.; Henry Yates Thompson, Esq.; Lieut.-Col. George Thompson*, C.E.; *Colonel H. J. Warre*, C.B.; *Samuel King Wilson, Esq.; Charles Warren, Esq.; Charles Henry Williams, Esq.*

Accessions to the Library between June 21st and November 8th, 1869.—'Die Balearen in Wort und Bild geschildert.' Leipzig, 1869. Donor, Sir R. I. Murchison. 'The Island of Hainan.' By E. C. Taintor. Donor, the author. 'Memoirs al Farabi.' By M. Steinschneider. Donor, the author. 'The Russo-Indian Question.' By Capt. F. Trench. Donor, the author. 'The New West.' By C. L. Brace. 'Our New West.' By S. Bowles. 'Our New Way Round the World.' By Charles C. Coffin. By purchase. 'New Tracks in North America.' By Dr. W. A. Bell. Donor, the author. 'The Mississippi Valley.' By J. W. Foster. Purchased. 'Palmæ Amazonicæ.' By R. Spruce. Donor, the author. 'Union Pacific

Railroad:' reports, maps, and official documents (various). Donor, Cyril Graham, Esq. 'Trade Routes, Central Asia.' By T. Douglas Forsyth. Donor, the author. 'Travels in Central Africa.' By Mr. and Mrs. Petherick. Donors, the authors. 'Reisehandbuch für London,' etc. Von E. G. Ravenstein. Donor, the author. 'The Last of the Tasmanians.' By James Bonwick. Donor, the author. George Thompson's 'War in Paraguay, 1869.' Photographs of the Bhore Ghauts. Presented by Colonel Yule.

Principal Accessions to the Map-room since last Meeting. Seven Photographs of Relief Models. By M. Bardin. Presented by Madame A. Bardin. Russian Map of the Province of Khokan, on 2 sheets. Presented by Lady Strangford. Atlas of Meteorological Maps of the South Atlantic Ocean, in 12 maps, with letterpress. Presented by the Meteorological Office, London. Part of the Revenue Survey of India; 29 sheets. Presented by the India Office, through Sir Bartle Frere. Several Maps and Plans of the United States. Presented by Mr. C. Graham. Two Sheets of the Topographical Map of Sweden. Presented by Major-Gen. Hazelius. Five Plans of the Ordnance Survey of Jerusalem, in case. Presented by the Ordnance Survey Office. Plans of the Suez Canal (4 in number). Presented by D. A. Lange, Esq. Five Maps. Presented by Dr. A. Petermann. Admiralty Charts (36 in number). Presented by the Lords Commissioners of the Admiralty.

The President opened the Session with the following address.

Gentlemen,—The two objects which most occupied our thoughts when the previous Session closed, and on which I dwelt in my last Anniversary Address, are now, I rejoice to say, in the way of being satisfactorily carried out. Our illustrious Associate Livingstone, whose life had been despaired of by the multitude, but of whose re-appearance among us, as you know, I never doubted, will, I trust, bring us ere long the first account of a region of Southern Africa never previously visited by a European; and thus, by actual observation, will have set at rest all theoretical speculations respecting the hydrography of that vast portion of Africa, lying to the north of those territories watered by the Zambesi which he had previously made his own.

I therefore joyfully hope that, at no very distant day we shall hear from his own lips the description of his travels during the three years which have elapsed since he entered South-Eastern Africa on his last expedition. In his expected communications we shall doubtless be enlightened not only respecting the true configuration of the great Lake Tanganyika, first visited by Burton

and Speke,* but also as to the main watershed to the south of it which he has now traced.

The facts, as communicated in one of his last letters to Dr. Kirk, from Lake Bangweolo, dated July 8th, 1868, will be explained to you this evening, in anticipation of more detailed accounts which have been sent to the Secretaries of State for Foreign Affairs and India, but which by some accident have not yet been received. [Here the President explained that the letters announced by Dr. Kirk had only just been received, and although he (the President) had not perused any of them, the public Despatch would, by permission of the Earl of Clarendon, be presently read to the meeting.] We now know that he had discovered a chain of lakes connected by rivers far to the south: but whether these waters, after feeding or flanking the great Lake Tanganyika, really constitute the ultimate sources of the Nile, as Livingstone supposes, can only be a conjecture so long as no traveller has observed the connection between the northern end of Tanganyika and Lake Albert Nyanza of Baker, which is very far distant from the southern lakes of Livingstone. But I confidently hope that this point will be finally determined by Livingstone himself; as it appears from Dr. Kirk's information that he has touched at Ujiji, and must have there received the supplies, despatches, publications, and medicines which have so long been waiting for him.

Should these South African waters, now laid open by Livingstone, flow into the Albert Nyanza, the south-western extremities of which are as yet wholly unknown (though, we trust, to be soon defined by Baker), then, indeed, the great modern problem will have been solved, and we must go back to the old geography of Ptolemy, and acknowledge that he was right in placing the ultimate sources of the Nile very nearly in the same southern tract in which Livingstone has now found them. In this event it will also give me much pleasure, at our ensuing Anniversary, to assign to Dr. Beke, Mr. Arrowsmith, and Mr. Findlay, all the credit which is their due for their support, on theoretical grounds, of this great southerly extent of the Nile Basin.

In his wonderful labours Livingstone has not merely been the

* Those who wish to form a clear idea of the vast inland Lake Tanganyika (about 300 miles in length), should peruse Capt. Burton's masterly memoir in the Twenty-fourth volume of the 'Journal of the Royal Geographical Society,' entitled 'Lake Regions of Central Equatorial Africa.' In that memoir the reader will find a graphic and lively account of the tract around Ujiji, and of the manners and condition of the inhabitants. It was for the important discovery of the Lake Tanganyika, in which he was assisted by Capt. Speke, that Capt. Burton, as leader of the East African Expedition, received, at my hands, the Gold Medal of the Society in 1859.

Christian Missionary and geographical explorer. He was also accredited as her Majesty's Consul to all the native States in the interior.* Such being the public mission with which the great traveller was entrusted, let us now confidently believe that Her Majesty's Government will authorize, on his return, the grant of a suitable pension to the man whose labours have shed so much renown on Britain, and that our gracious Sovereign, who has, I know, taken the deepest interest in his career, will reward him with some appropriate token of her good will.

Turning our eyes from the Africa of Livingstone, or South Africa properly so called, to Central or Equatorial Africa, in which lie those great water-basins which, thanks to the labours of Speke, Grant, and Baker, are known to feed the Nile, we have been rejoiced to learn, during our recess, that the last-named of these gallant explorers has been entrusted by the Viceroy of Egypt with a mission which, whether we view it as the first step in bringing a vast disorderly region of warring and barbarous tribes under the regular government of that potentate, or as defining the boundaries of those vast internal waters, does the highest credit to our associate who planned it, and to the powerful ruler who has so munificently engaged to defray the expenses of so costly an expedition.

By the employment of steam launches (prepared in this country by Mr. Samuda), and supported as he is by all the power of Egypt, we have every reason to hope that Sir Samuel Baker will succeed in realizing his grand conception, and that, encouraged once more by that heroic wife who has been his companion in all his African researches, we may confidently anticipate that this noble effort will be crowned with deserved success.

Besides the results of these two great expeditions, we expect to receive during the Session an account of another African Exploration, undertaken by Mr. Winwood Reade, under our auspices, and at the cost of a munificent patron of scientific enterprize, our associate Mr. Andrew Swanzy. Foiled in his first attempt to penetrate the interior of Western Africa by the Assinie River, Mr. Reade shifted his base of operations to Sierra Leone, and there, supported by the Governor and the principal merchants, has advanced through the territory of the coast tribes towards the Sources of the Niger. By letters recently received, dated the 1st August last, we learn that this adventurous traveller had reached Farabana, a town of 10,000 inhabitants unknown to

* See the 'Gazette' of March 24th, 1865, p. 1676.

geographers, on the upper waters of the Niger, beyond the point reached by Caillié and other European travellers.

Among the communications which will be brought before the Society, my associates will hear with pleasure that so much new and interesting matter will be made known respecting Central Asia, and particularly in regard to the countries immediately beyond the north-western boundaries of our Indian Empire. This engrossing subject will necessarily give rise to much discussion during the ensuing year. Thus, although our Envoy, Mr. Hayward, who went out specially charged by the Council, to examine, if possible, the vast and wild territory of the Pamir Steppe, in which the rivers Oxus and Jaxartes have their rise, had his advance in that direction stopped by the recent civil war beyond our frontier, we now know that, taking up the route viâ Ladakh, he penetrated to Yarkand and Kashgar, the chief towns of Eastern Turkestan. He has, indeed, prepared maps which, defining the practicable passes through those lofty mountains, throw a new light on the courses of the rivers and the configuration of the dividing ranges.

Being satisfied with the work he had already accomplished, we are glad to learn that, nothing disheartened, Mr. Hayward has resolved to try once more to enter into and examine the great Pamir Steppe, called by the natives the "Backbone of the World," and into which no Russian nor British geographer has ever penetrated. Our Council has thus accordingly supplied him with the pecuniary means to work out this important geographical problem. In doing this, I cannot too carefully impress upon the public that Mr. Hayward is solely our agent for purposes of pure geography.

Though placed in surveillance whilst in Eastern Turkestan, now governed by Yakoob Kooshbegie, Mr. Hayward was always kindly and hospitably treated by that great Mussulman Chief. When we employed him on this mission, we had no accurate knowledge of the efforts which were about to be made to send a caravan of tea from the plantations on the south side of the Himalayan regions, to sell the same to the inhabitants of a vast region formerly a part of China, and now deprived of the supply of a beverage to which for ages they had been accustomed. Encouraged by our accomplished associate Mr. R. Douglas Forsyth, who had been for some time the British Commissioner on the frontiers of Cashmir, and had seized every opportunity of promoting a friendly intercourse with Eastern Turkestan, you now know that Mr. Shaw, an English tea-planter of Kangra, had threaded the lofty mountain passes and had reached Yarkand at the same time as Mr. Hayward.

This simultaneous arrival of two Englishmen, though quite accidental—the one as a merchant, the other as a scientific explorer, a character wholly unintelligible to them—very naturally alarmed the native Yarkandis, who had never seen an Englishman.* But the good conduct of our two countrymen, whether at Yarkand or at Kashgar, ultimately led to the persuasion that both were simply making inquiries as to the best practicable routes for trade between India and Turkestan; and it is much to the credit of the Mahomedan ruler that he treated both the travellers with kindness, and expressing a strong desire to trade with us, allowed them to return together to British India. This powerful and despotic ruler of Eastern Turkestan has taken the title of Ataligh Ghazee, or Leader of the Faithful, by which he is always called. His rule is popular, and his subjects prosperous, and he expressed to Mr. Shaw his great desire to be on friendly terms with England. Let us therefore hope that an intercourse, like that which has long been carried on with them by the Russians, may also thrive for the benefit of our country.

Of the people of Eastern Turkestan, Dr. Cayley (the political agent in Ladakh), thus writes:—"The English travellers were greatly surprised at the civilization, wealth, and prosperity, of the people of Yarkand, who seem far in advance of most Asiatics. The polite, well-bred, and at the same time independent manners, even of the common people, is very striking. There is no religious intolerance towards foreigners, and the people will sit down and eat and drink with any one. They are essentially mercantile, and speak eagerly of trading with India."

It is also satisfactory to learn, that the Earl of Mayo, the Governor-General of India, takes the most lively interest in the full development of the geographical features of this vast region, and also of the condition and wants of the natives, whilst he entirely approves of all the important preliminary steps which have been taken to bring about a good understanding and useful trade between these hitherto unexplored countries and British India.

Whilst on this topic I cannot but advert to the praiseworthy conduct of Dr. Leitner, a learned philologist, who, having been employed by the Government in the countries bordering upon the British territory, has recently, while on leave, brought to England

* When it is said that no Englishman ever visited this region, we must not forget that the unfortunate and accomplished Adolf Schlagintweit, a Prussian subject, but acting at the cost of the Indian Government, did reach Kashgar, and there met with his death. Here it is right to state that the present ruler expressed to Mr. Shaw his sorrow for the murder of Schlagintweit by the robber Wulee Khan, who was executed two years ago by order of the Ataligh Ghazee.

a native of Yarkand, the first of his nation who has ever been in Europe, and who is present on this occasion. As this intelligent young man speaks several languages, including Chinese, and understands Hindustanee, we may, judging from him, form a fair idea of how intelligent a people there exists beyond the north-west frontier of British India, and that as this country affords various products of fine wool, silks, and fruits of many sorts, besides numerous minerals of value, we may in the end largely benefit by sending in exchange for them our tea from Hindostan, and manufactured goods from Britain.

Various other topics will come before us during the Session, the interest of which I will not forestall by entering into details respecting them. Such, for example, is the exploration of the new course which the Yellow River of China has taken since the year 1851, by our enterprising associate Mr. Elias, an account of which will be read to you this evening. Another paper of high interest is one on the Physical Geography and Ethnology of the Runn of Cutch and neighbouring regions, by Sir Bartle Frere, an outline of which was given at the last meeting of the British Association for the Advancement of Science. A third memoir, which will be found attractive, is by Captain Mayne, R.N., on his recent Survey of the Straits of Magellan.

We hope also to see again before us Dr. Bell, who gave last Session an interesting account of his journey through the little-known region of Arizona and neighbouring territories in North America, and who has since published his 'New Tracks in North America,' a book now attracting deservedly much notice. We are informed by him that during a recent visit to North America he met Major Powell, of the United States' Army, who had just accomplished an exploration of that wonderful chasm, or cañon, through which the great river Colorado flows for several hundred miles; and he has promised to lay before us the results of this remarkable journey as soon as he receives the Major's reports. We may expect, also, an account of another of Mr. Chandless' remarkable river-explorations in South America, the last letter from that able and courageous traveller informing us that he was on his way up the River Madeira to explore the Beni to its sources in the Andes.

Many other papers will, I doubt not, flow in; and already I anticipate as full and active a Session as any of those which have sustained the reputation of the Royal Geographical Society.

The following letters were then read:—

1. *Extracts of a Letter from* Dr. Livingstone *to* Dr. Kirk.

"Near Lake 'Bangweolo,' 8th July, 1868.

. . . . After enumerating things needed, such as cloth, beads, &c., which are to be sent to Ujiji by first opportunity, Dr. Livingstone adds:—"I have had no news from anywhere for two years and upwards. The Arabs have all been overflowing in kindness. I borrow this paper from Mohammed Bogarib, for I am up here without any. I am greatly obliged by the Sultan's letter, and beg you to say so to his highness. I don't know which of his subjects has served me most, where all have shown kindness and goodwill.

"For Captain Fraser and our friends at Zanzibar, I may say I have found what I believe to be the sources of the Nile between 10° and 12° s., or nearly in the position assigned them by Ptolemy.

"It is not one source from a lake, but upwards of twenty of them. Lake Liemba, which possibly is an arm of Tanganyika, has four rivers flowing into it. One I measured, and found it to be 294 feet—say 100 yards—high, and waist deep, and flowing fast in September. No rain had fallen since May 12; elsewhere it almost requires canoes. This has eleven good-sized 'burns' flowing into it. Taking these four rivers as one line of drainage (a fifth from Marungu must be added), then the Chambeze flows from the side into the centre of a great valley, and receives three streams as large as the Isis at Oxford or Avon at Hamilton. The Chambeze enters Bangweolo Lake and receives two streams; then changes its name to Luapula, and flowing north receives two streams about fifty yards broad each. Luapula receives one, and enters Moero Lake to receive five streams, one is eighty yards broad and always requires canoes. On leaving Moero it is called Lualaba, which receives two good-sized streams, and it forms Uienge, either a lake with many islands or a division with many streams, which are taken up by the Lufira, a large river which, by five branches, drains the west side of the great valley, which probably is that of the Nile. I have still to follow down the Lualaba, and see whether, as the natives assert, it passes Tanganyika to the west, or enters it and finds an exit by the river called Luanda into Lake Chowambe, which I conjecture to be that discovered by Mr. Baker.

"I shall not follow the Lualaba by canoes, as we did the Zambesi from near the Victoria Falls to Kebrabassa; that was insanity, and I am not going to do any more mad things.

"If any letters have come for me, please send them on to Ujiji till further notice. I send to your care a letter to Lord Clarendon, one for Miss Livingstone, and one for Sir Roderick Murchison, and I trust you will forward them safely at your convenience in proper envelopes.

"Yours &c.,

(Signed) "David Livingstone."

---

2. *Despatch from* Dr. Livingstone *to the* Earl of Clarendon.

"Near Lake Bangweolo, South Central Africa,

"My Lord, July, 1868.

"When I had the honour of writing to you in February, 1867, I had the impression that I was then on the watershed between the Zambesi and either the Congo or the Nile. More extended observation has since convinced me of the essential correctness of that impression; and from what I have seen, together with what I have learned from intelligent natives, I think that I may safely assert that the chief sources of the Nile, arise between 10° and 12° south latitude, or nearly in the position assigned to them by Ptolemy, whose River Rhaptus is probably the Rovuma. Aware that others have been mistaken, and

laying no claim to infallibility, I do not yet speak very positively, particularly of the parts west and north-west of Tanganyika, because these have not yet come under my observation; but if your Lordship will read the following short sketch of my discoveries, you will perceive that the springs of the Nile have hitherto been searched for very much too far to the north. They rise some 400 miles south of the most southerly portion of the Victoria Nyanza, and, indeed, south of all the lakes except Bangweolo.

"Leaving the valley of the Loangwa, which enters the Zambesi at Zumbo, we climbed up what seemed to be a great mountain mass, but it turned out to be only the southern edge of an elevated region, which is from 3000 to 6000 feet above the level of the sea. This upland may roughly be said to cover a space south of Lake Tanganyika, of some 350 miles square. It is generally covered with dense or open forest, has an undulating, sometimes hilly, surface; a rich soil; is well watered by numerous rivulets, and, for Africa, is cold. It slopes towards the north and west, but I have found no part of it under 3000 feet of altitude. The country of Usango, situated east of the space indicated, is also an upland, and affords pasturage to the immense herds of cattle of the Basango, a remarkly light-coloured race, very friendly to strangers. Usango forms the eastern side of a great but still elevated valley. The other or western side is formed by what are called the Kone Mountains, beyond the copper-mines of Katanga. Still further west, and beyond the Kone range or plateau, our old acquaintance the Zambesi, under the name of Jambaji, is said to rise. The southern end of the great valley inclosed between Usango and the Kone range is between 11° and 12° s. It was rarely possible there to see a star, but accidently awaking one morning between 2 and 3 o'clock, I found one which showed latitude 11° 56′ s., and we were then fairly on the upland. Next day we passed two rivulets running north. As we advanced, brooks, evidently perennial, became numerous. Some went eastward to fall into the Loangwa; others went north-west to join the River Chambeze. Misled by a map calling this river in an off-hand manner 'Zambezi, eastern branch,' I took it to be the southern river of that name; but the Chambeze, with all its branches, flows from the eastern side into the centre of the great upland valley mentioned, which is probably the valley of the Nile. It is an interesting river, as helping to form three lakes, and changing its name three times in the 500 or 600 miles of its course. It was first crossed by the Portuguese, who always inquired for ivory and slaves, and heard of nothing else. A person who collected all, even the hearsay geography of the Portuguese, knew so little actually of the country that he put a large river here running 3000 feet up-hill, and called it New Zambesi.

I crossed the Chambeze in 10° 34′ s., and several of its confluents south and north, quite as large as the Isis at Oxford, but running faster, and having hippopotami in them. I mention these animals because in navigating the Zambezi I could always steer the steamer boldly to where they lay, sure of finding not less than 6 feet of water. The Chambeze runs into Lake Bangweolo, and on coming out of it assumes the name Luapula. The Luapula flows down north past the town of Cazembe, and 12 miles below it enters Lake Moero. On leaving Moero at its northern end by a rent in the mountains of Rua, it takes the name Lualaba, and passing on N.N.W., forms Ulenge in the country west of Tanganyika. I have seen it only where it leaves Moero, and where it comes out of the crack in the mountains of Rua, but am quite satisfied that even before it receives the River Sofumo from Marunga, and the Soburi from the Baloba country, it is quite sufficient to form Ulenge, whether that is a lake with many islands, as some assert, or a sort of punjaub—a division into several branches, as is maintained by others. These branches are all gathered up by the Lufira—a large river, which by many confluents drains the western side of the great valley. I have not seen the Lufira, but pointed out west of 11° s., it is there asserted always to

require canoes. This is purely native information. Some intelligent men assert that when the Lufira takes up the water of Ulenge, it flows N.N.W. into Lake Chowambe, which I conjecture to be that discovered by Mr. Baker. Others think that it goes into Lake Tanganyika at Uvira, and still passes northward into Chowambe by a river named Loanda. These are the parts regarding which I suspend my judgment. If I am in error there and live through it, I shall correct myself. My opinion at present is if the large amount of water I have seen going north does not flow past Tanganyika on the west, it must have an exit from the Lake, and in all likelihood by the Loanda.

"Looking back again to the upland, it is well divided into districts, Lobisa, Lobemba, Ubengu, Itawa, Lopere, Kabuire, Marungu, Lunda or Londa, and Rua; the people are known by the initial 'Ba' instead of the initial 'Lo' or 'U' for country. The Arabs soften 'Ba' into 'Wa,' in accordance with their Suaheli dialect; the natives never do. On the northern slope of the upland, and on the 2nd of April, 1867, I discovered Lake Liemba; it lies in a hollow, with precipitous sides 2000 feet down; it is extremely beautiful, sides, top, and bottom being covered with trees and other vegetation. Elephants, buffaloes, and antelopes feed on the steep slopes, while hippopotami, crocodiles, and fish swarm in the waters. Guns being unknown, the elephants, unless sometimes deceived into a pitfall, have it all their own way. It is as perfect a natural paradise as Xenophon could have desired. On two rocky islands men till the land, rear goats, and catch fish; the villages ashore are embowered in the palm-oil palms of the West Coast of Africa. Four considerable streams flow into Liemba, and a number of brooks (*Scottice*, 'trout *burns*'), from 12 to 15 feet broad, leap down the steep bright red clay-schist rocks, and form splendid cascades, that made the dullest of my attendants pause and remark with wonder. I measured one of the streams, the Lofu, 50 miles from its confluence, and found it at a ford 294 feet, say 100 yards broad, thigh and waist deep and flowing fast over hardened sandstone flag in September—the last rain had fallen on the 12th of May. Elsewhere the Lofu requires canoes. The Lousua drives a large body of smooth water into Liemba, bearing on its surface duckweed and grassy islands; this body of water was 10 fathoms deep. Another of the four streams is said to be larger than the Lofu, but an over-officious headman prevented my seeing more of it and another than their mouths. The lake is not large, from 18 to 20 miles broad, and from 35 to 40 long; it goes off N.N.W. in a river-like prolongation two miles wide, it is said, to Tanganyika: I would have set it down as an arm of that lake, but that its surface is 2800 feet above the level of the sea, while Speke makes that 1844 feet only. I tried to follow the river-like portion, but was prevented by a war which had broken out between the Chief of Itawa and a party of ivory traders from Zanzibar. I then set off to go 150 miles south, then west, till past the disturbed district, and explore the west of Tanganyika; but on going 80 miles I found the Arab party, showed them a letter from the Sultan of Zanzibar, which I owe to the kind offices of his Excellency Sir Bartle Frere, Governor of Bombay, and was at once supplied with provisions, cloth, and beads; they showed the greatest kindness and anxiety for my safety and success. The heads of the party readily perceived that a continuance of hostilities meant shutting up the ivory market, but the peace-making was a tedious process, requiring 3½ months; I was glad to see the mode of ivory and slave trading of these men, it formed such a perfect contrast to that of the ruffians from Kilwa, and to the ways of the atrocious Portuguese from Tette, who were connived at in their murders by the Governor D'Almeida.

"After peace was made I visited Msama, the Chief of Itawa; and, having left the Arabs, went on to Lake Moero, which I reached on the 8th September, 1867. In the northern part Moero is from 20 to 33 miles broad. Further south it is at least 60 miles wide, and it is 50 miles long. Ranges of tree-

covered mountains flank it on both sides, but at the broad part the western mountains dwindle out of sight. Passing up the eastern side of Moero we came to Cazembe, whose predecessors have been three times visited by Portuguese. His town stands on the north-east bank of the lakelet Mofwe; this is from two to three miles broad and nearly four long. It has several low, reedy islets, and yields plenty of fish—a species of perch. It is not connected with either the Luapula or Moero. I was forty days at Cazembe's, and might then have gone on to Bangweolo, which is larger than either of the other lakes; but the rains had set in, and this lake was reported to be very unhealthy. Not having a grain of any kind of medicine, and, as fever, without treatment, produced very disagreeable symptoms, I thought that it would be unwise to venture where swelled thyroid gland, known among us as Derbyshire-neck, and elephantiasis (scroti) prevail. I then went north for Ujiji, where I have goods, and, I hope, letters: for I have heard nothing from the world for more than two years: but when I got within 12 days of Tanganyika, I was brought to a stand-still by the superabundance of water in the country in front. A native party came through, and described the country as inundated so as often to be thigh and waist deep, with dry sleeping-places difficult to find. This flood lasts till May or June. At last I became so tired of inactivity that I doubled back on my course to Cazembe.

"To give an idea of the inundation which, in a small way, enacts the part of the Nile lower down, I had to cross two rivulets which flow into the north end of Lake Moero; one was 30, the other 40 yards broad, crossed by bridges; one had a quarter, the other half a mile of flood on each side. Moreover, one, the Luao, had covered a plain abreast of Moero, so that the water on a great part reached from the knees to the upper part of the chest. The plain was of black mud, with grass higher than our heads. We had to follow the path which, in places, the feet of passengers had worn into deep ruts. Into these we every now and then plunged and fell, over the ancles in soft mud, while hundreds of bubbles rushed up, and, bursting, emitted a frightful odour. We had four hours of this wading and plunging—the last mile was the worst; and right glad we were to get out of it to the sandy beach of Moero and bathe in the clear tepid waters. In going up the bank of the lake we first of all forded four torrents, thigh-deep; then a river 80 yards wide, with 300 yard sof flood on its west bank, so deep we had to keep to the canoes till within 50 yards of the higher ground; then four brooks, from 5 to 15 yards broad. One of them, the Chungu, possesses a somewhat melancholy interest, as that on which poor Dr. Lacerda died. He was the only Portuguese visitor who had any scientific education, and his latitude of Cazembe's town on the Chungu being 50 miles wrong, probably reveals that his mind was clouded with fever when he last observed, and any one who knows what that implies will look on his error with compassion. The Chungu went high on the chest, and one had to walk on tiptoe to avoid swimming. As I crossed all these brooks at both high and low water, I observed the difference to be from 15 to 18 inches, and from all the perennial streams the flood is a clear water. The state of the rivers and country made me go in the very lightest marching order; took nothing but the most necessary instruments, and no paper except a couple of note-books and the Bible. On unexpectedly finding a party going to the coast, I borrowed a piece of paper from an Arab, and the defects unavoidable in the circumstances you will kindly excuse. Only four of my attendants would come here; the others, on various pretences, absconded. The fact is, they are all tired of this everlasting tramping, and so verily am I. Were it not for an inveterate dislike to give in to difficulties, without doing my utmost to overcome them, I would abscond too. I comfort myself by the hope that by making the country and people better known I am doing good; and by imparting a little knowledge occasionally, I may be working in accordance with the plans of an all-embracing Providence which now forms part of the belief of all the more

intelligent of our race, my efforts may be appreciated in the good time coming yet.

"I was in the habit of sending my observations to the Cape Observatory, where Sir Thomas Maclear, the Astronomer-Royal, and the Assistant-Astronomer, Mr. Mann, bestowed a great deal of gratuitous labour on them in addition to the regular duties of the Observatory. They tested their accuracy in a variety of ways, which those only who are versed in the higher mathematics can understand or appreciate. The late Earl of Ellesmere publicly said of a single sheet of these most carefully-tested geographical positions, that they contained more true geography than many large volumes. While the mass of observations which went to the Royal Observatory at the Cape required much time for calculation, I worked out a number in a rough way, leaving out many minute corrections, such as for the height of the thermometer and barometer, the horizontal parallax and semi-diameter of planets, using but one moon's semi-diameter and horizontal parallax for a set of distances, though of several hours' duration; corrections for the differences of proportional logarithms, &c.; and, with these confessedly imperfect longitudes, made and sent home sketch-maps to give general ideas of the countries explored. They were imperfect, as calculated and made in the confusion of the multitude of matters that crowd on the mind of an explorer, but infinitely better than many of the published maps. Sir Thomas Maclear, for instance, says that short of a trigonometric survey, no river has been laid down so accurately as the Zambesi; and Mr. Mann, after most careful examination of the series of chronometric observations which more than once ran from the sea and Tette up to Lake Nyassa, says that any error in the longitude cannot possibly amount to four minutes.

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"My borrowed paper is done, or I should have given a summary of the streams which, flowing into the Chambeze, Luapula, Lualaba, and the lakes, may be called sources. Thirteen, all larger than the Isis at Oxford, or Avon at Hamilton, run into one line of drainage; five into another, and five into a third receptacle—twenty-three in all. Not having seen the Nile in the north, I forbear any comparison of volume. I trust that my labours, though much longer than I intended, may meet with your Lordship's approbation.

"I have, &c.,

(Signed) "DAVID LIVINGSTONE.

"P.S. Always something new from Africa: a large tribe lives in underground houses in Rua. Some excavations are said to be 30 miles long, and have running rills in them—a whole district can stand a siege in them. The 'writings' therein I have been told by some of the people are drawings of animals, and not letters, otherwise I should have gone to see them. People very dark, well made, and outer angle of eyes slanting inwards."

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3. *Extracts from a Letter of* Dr. LIVINGSTONE *to the* PRESIDENT.

"MY DEAR SIR RODERICK, "Near Lake Bangweolo, 8th July, 1868.

"My letter to Lord Clarendon will explain what I have been doing, and why I can only give you a leaf out of my Note-book. The sources of the Nile are undoubtedly between 10° and 12° s., not one or two, but upwards of twenty of them rise south of all the lakes except Bangweolo. The great valley is exactly like the valleys of the Congo and Zambesi, and you have been seeking the sources too far to the north. I have yet to follow down the three lines of drainage into which the twenty-three sources converge, and do not speak very positively as to whether they flow past Tanganyika to the

west into Chowambe, which I suppose to be Baker's Lake, or into Tanganyika, and through by a river named Loanda into the same lake.

* * * * *

"We are in the same quarter of the world yet. I do not know if Kirk has come to Zanzibar. I hope in a couple of months to be at Ujiji, where I have goods and I hope letters. Want of paper prevents my writing to my friends. A note for Agnes goes by this.

"With love to Lady Murchison, I am ever affectionately yours,

(Signed) "DAVID LIVINGSTONE."

"POSTSCRIPT.—The following is a summary on sources. From 30 to 40 yards broad, and always deep enough to require either canoes or bridges. Chambese, Luapula, Lualaba, and the Lakes receive thirteen sources, each larger than the Isis at Oxford or Avon at Hamilton. Another line of drainage receives five sources. A third receives other five, or twenty-three (23) in all. I do not count small burns from 5 to 10 or 15 yards broad. Lofu has eleven of these, all perennial, nor do I refer to the oozes or sponges, which are the sources of them all.

(Signed) "D. L."

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4. *Letter from* Dr. LIVINGSTONE *to* Sir BARTLE FRERE.

"Near Lake Bangweolo, South Central Africa,

"MY DEAR SIR BARTLE, July, 1868.

"When I wrote to you in February, 1867, I had the impression that I was then on the watershed between the Zambesi and either the Congo or the Nile. Further observation now leads me to believe that impression to have been correct; and from what I have myself seen, together with what I have heard from intelligent natives, I think that I can safely assert that the chief sources of the Nile rise between 10° and 12° s. latitude; or nearly in the position assigned to them by Ptolemy, whose River Rhapta is probably the Rovuma. I cannot yet speak positively of the parts w. and N.N.W. of Tanganyika, because these have not yet come under my observation; but, if you will read the following short sketch of what I have seen, you will see that the springs of the Nile have hitherto been sought for very much too far to the north.

"Leaving the valley of the Loangwa at 12° s., we climbed up what seemed to be a great mass of mountains; but it turned out to be the southern edge of an elevated region, the height of which is from 4000 to 6000 feet above the level of the sea. This upland may be roughly said to cover a space south of Lake Tanganyika of some 350 miles square. It is generally covered with dense forest, has an undulating surface, a rich soil, is well watered with numerous rivulets, and, for Africa, is cold. It slopes towards the north and west, but I have not seen any part of it under 3000 feet of altitude. The country of Usango, situated east of the space indicated, is also an upland, and affords pasturage for the immense herds of cattle of the Basango (Wasango of the Arabs), a very light-coloured race, very friendly with strangers. Usango forms one, the eastern side of the southern end of a great but still elevated valley. The other, or western side, is formed by what are called the Kone Mountains, beyond the copper-mines of Katanga. Still further west, and beyond the Kone Range or plateau, rises our old acquaintance the Zambesi by the name of Jambaji. Referring back to 12° s.—it was rarely possible to obtain even a latitude; but accidentally awaking one morning after we were fairly on the upland, I found a star which showed lat. 11° 56′ s., and next day we crossed

two rivulets running north. As we advanced brooks became numerous, some went backwards or sideways into the Loangwa, and with it to join the Zambesi at Zumbo, but the greater number went north or north-west into the River Chambeze. This—misled by a map calling it, in an offhand manner, '*Zambezi, Eastern branch*'—I took to be the river so indicated; but the Chambeze, with all its branches, flows from the side into the centre of the great Nile Valley. It is remarkable as helping to form three lakes, and changing its name three times in the 500 or 600 miles of its course. First of all it is the Chambeze, which I crossed in 10° 34′ s. I crossed several of its confluents, both on its south and north, quite as large as the Isis at Oxford, but running faster, and having hippopotami in them. I mention these animals, because, when navigating the Zambesi, I steered always boldly on to where these beasts lay, sure of never finding less than eight feet of water. The Chambeze flows into Lake Bangweolo, and on coming out of it assumes the name Luapula. Luapula flows down north, past the town of Cazembe, and then enters Lake Moero. On emerging from it the name Lualaba is taken. In passing on s.s.w. it becomes very large, and forms Ulenge in the country west of Tanganyika. I have seen it only where it leaves Moero by a crack in the mountains of Rua, and where it comes out again, and am sure it is sufficient to form Ulenge, whether it is a lake with many islands in it, or a panjaub, if I may use the word, before its waters are all gathered up by the Lufira, a large river, which drains the western side of the great valley and having its sources between 11° and 12° s. Beyond Ulenge, and Ulenge itself, is purely native information; and some believe that when the Lufira takes it up it flows s.s.w. into a large lake named Chowambe, which I conjecture to be that discovered by Mr. Baker: others think that it goes into Tanganyika, and flows thence into Chowambe, by a river named Loanda. I suspend my judgment, but think if the immense amount of water I have seen going north does not flow past Lake Tanganyika on the west, it must have an exit, and in all probability it is by the Loanda.

"Referring again to the upland, I found it divided into districts—Lobisa, Lobemba, Ulungu, Itawa, Lopere, Kabuire, Lunda, and Rua; the people are known by putting Ba- instead of the initial syllable for country, Lo or U; the Arabs use Wa instead of Ba, as that is Swahili. On the slope north, and in the Balungu country, I discovered Lake Liemba on 2nd April, 1867. It lies in a hollow, with precipitous sides 2000 feet down. It is extremely beautiful, sides, top, and bottom being richly clothed with trees and other vegetation. Elephants, buffaloes, and antelopes feed on the steep slopes; fish and hippopotami swarm in the waters. Two rocky islands are inhabited by fishermen, who, besides fishing, cultivate the ground and rear goats. The lake is not large, from 18 to 20 miles broad, and from 30 to 40 long. Four good-sized rivers flow into it, and many '*burns*' (*Scotice* for brooks), which form pretty cascades as they leap down the bright red clay-schist rocks. It goes away in a river-like prolongation two miles wide, s.s.w. it is said, to Tanganyika. Were it not 2800 feet above the sea, I should consider it an arm of that lake, but Speke makes it 1844 feet only. I tried to follow this arm, but was prevented by war. A large party of Arab traders from Zanzibar had been attacked by the Chief of Itawa. I set off to go round about the disturbed district; met the Arabs, and, having showed them Seyd Majid's letter, was at once supplied with cloth, beads, and provisions. Thanks to your good offices with the Sultan, I have been treated by all the Arabs with the greatest kindness and consideration. The heads of the party readily perceived that a continuance of hostilities meant shutting up the ivory market, so peace was made, but the process required three months and a half. They would not allow me to go into any danger, so I had to remain at a village 4700 feet above the sea, and employ my time in the pig's employment of taking on fat. When we did move I went someway west with my Arab friends, and I am glad that I saw their mode

of ivory and slave trading. It was such a contrast to that of the ruffians from Kilwa and the Portuguese from Tette. On leaving them we came to Moero on the 8th November, 1867. This is the northern part is from 20 to 33 miles broad. Further south it is at least 60 miles in width, and it is 50 miles long; ranges of tree-covered mountains flank it on both sides. We passed up its eastern shore and visited Cazembe, who has several times been visited by Portuguese. I remained 40 days with Cazembe, and might have come on to Bangweolo; but the rains had set in, and this lake was reported to be very unhealthy. Not having a grain of any kind of medicine, and as fever without treatment produces fits of total insensibility and loss of power over the muscles of the back, I thought it would be unwise to venture. Went north, intending to go to Ujiji for goods and letters, not having heard a word of any kind from anywhere for two years, but I was brought to a standstill at a distance of 15 days from Tanganyika by the superabundance of water in the country in front. A native party came through, and described the waters as often thigh and waist deep and sleeping-places difficult to find. This inundation lasts till May or June. When I became utterly tired of inactivity, I doubled back in my course to Cazembe in April; and that you may understand the nature of the flood that here annually enacts the part of the Nile further down, I may say that two rivulets, each from 30 to 40 yards broad, flow into the north end of Moero. One had a quarter and the other half a mile of flood on each bank, from thigh to waist deep. They were crossed by bridges. Then one of them had flooded a plain abreast of Moero, and we had four hours of plunging in water and black mud. The last mile was the worst, though the rest had many deep ruts, into which, from not seeing them, we plunged and sent up a rush of hundreds of bubbles to the surface, all charged with a frightful odour. Before getting out to the clean sandy beach of Moero the flood-water was high up on the chest. Then we had to wade four brooks thigh-deep, cross a river 80 yards broad with 300 yards of flood on its western bank so deep we had to keep to the canoes till within 50 yards of the higher grounds. Four other brooks had to be forded ere we reached Cazembe. One, the Chungu, was the scene of Dr. Lacerda's death. He was the only Portuguese of any scientific acquirements, and was 50 miles wrong in latitude alone. Probably fever clouded his mind when he observed, and any one who knows what that implies will readily excuse any mistake he may have made.

"The Chungu went high up on the chest, and one had to walk on tiptoe to avoid swimming. Only four of my attendants would come; the others absconded on various pretexts. The fact is, they are all tired of this everlasting tramping, and so am I. Nothing could be brought but the veriest necessaries,—no paper, only a couple of note-books and the Bible. I have borrowed this and another sheet from an Arab trader; the other is for Lord Clarendon, and they will go by a party proceeding to the coast through Usango. I would go myself, if it were not for an inveterate dislike to give up what I have undertaken without finishing it. I am often distressed in thinking of a son whom I left at the University of Glasgow. He was to be two years there, then spend a year or more in Germany for French and German, before trying the Civil Service examination for India. He will now be in especial need of my counsel and assistance, and here I am at Bangweolo. His elder brother, after being well educated, wandered into the American war, and we know no more of him after an engagement before Richmond. Possibly, Sir Charles Wood, in consideration of my services, might do something to fix this one. I never asked anything for myself. Lord Palmerston sent Mr. Hayward, a Queen's Counsel, to me before I left home this time, to ask 'what he could do for me, as he was most anxious to serve me.' I don't know how it was, but it never once occurred to me, till I was in here, that he meant anything for myself. I replied that if he could open the Portuguese ports in

East Africa to free trade, this was the greatest boon he could confer. I thought only of my work, and not of myself or children. I feel more at liberty in telling you of my domestic anxiety, and my fears lest Tom should go to the examination unprepared, because you have a family yourself, and will sympathise with me. I shall give Lord Clarendon the same geographical information as I have given you; and as I have not the conscience to ask more paper from my Arab friend, I shall ask Miss Frere to favour me by writing to my daughter a little of the above, and sending it to Mr. Murray, who will know where she is. Agnes is to tell Tom not to go in for examination till he is well prepared, and he may take a year more of education where he may have found the most benefit. I had written you a long letter, which now lies at Kabuire; the foregoing contains the substance of it. Miss Frere must take this into consideration, if annoyed at my asking her to write to a stranger in such a climate as that of India. I regret that the Nile has prevented me from following out my aspirations for the benefit of the people. I sometimes comfort myself by the hope that by making this country and its inhabitants better known, and occasionally imparting a little knowledge, I may be working in accordance with the plans of the all-embracing Providence for the good time coming yet. At other times, I feel as if serving a few insane geographers, who will count me a man and a brother. There is a large tribe of Troglodytes in Rua, with excavations 30 miles in length, and a running rill passing along the entire street. They ascribe these rock-dwellings to the hand of the Deity. The 'writings' in them are drawings of animals; if they had been letters, I must have gone to see them. People very black, strong, and outer angle of eyes upwards. The summary of sources I give Lord Clarendon as flowing into Chambeze—Loapula, Lualaba; and the lakes are thirteen in all, and are larger than the Isis at Oxford and Avon at Hamilton. Five in another line of drainage, and five in a third receptacle, make twenty-three in all: these do not include 'burns.' Lofu has eleven of them, from 5 to 15 yards wide, and perennial. I did get a bit of paper and write to Agnes, so Miss Frere is absolved from the penance. Love to Lady Frere and her family.

(Signed) "DAVID LIVINGSTONE."

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5. *Letter from* Dr. KIRK *to* C. GONNE, Esq., *Secretary to the Government, Bombay.*

"SIR, "Zanzibar, 7th September, 1869.

"The chief point of geographical interest in the present letter of Dr. Livingstone is the statement that the sources of the Nile are to be found in the lakes and rivers that drain the great valley in which Cazembe is situated, and lying to the south of Tanganyika, between 10° and 12° of south latitude.

"The town of Cazembe, from which Dr. Livingstone's previous letters (December, 1867) were dated, has been already visited and described by two Portuguese missions. It is situated on the shores of one of a chain of lakes and rivers that flow northwards.

"The Chambeze, having collected by many streams the waters of the northern slope of the damp, elevated plains, flows to join Lake Bangweolo; this, again, is connected with Lake Moero by the Loapula, on whose banks the town of Cazembe is built. Moero is, in its turn, drained by the Lualaba into another lake, named Ulenge, and here exploration ends.

"Natives have told Dr. Livingstone that Ulenge is an island-studded lake, whose waters join the Lufira, a large river coming from the western side of the same great plain, whose eastern slope is drained by the Chambeze. This united stream, some say, enters the Tanganyika, and thence, by the Loanda, into Lake Chowambe; but Dr. Livingstone's informants are not unanimous, and some assert that the Lufira passes to the west of Tanganyika, and so to the

Lake Chowambe, which Dr. Livingstone thinks is the same as the Albert Nyanza of Sir Samuel Baker.

"In fact, the interest of the journey centres in the southern connections of the Albert Nyanza, and Arab traders generally agree in thinking that a water-communication does exist between that and the Tanganyika, but I have not met with any one who professes to have traced out this communication.

"From Arabs who visit Cazembe I learn that the lakes now described by Dr. Livingstone are of considerable size, probably from five to ten days' march in length, and, like Nyassa, Tanganyika, and the Albert Nyanza, overhung by high mountain-slopes, which open out in bays and valleys, or leave great plains, which, during the rainy season, become flooded, so that caravans march for days through water knee-deep, seeking for higher ground on which to pass the night. The country abounds with large game and domestic cattle, while the climate is spoken of as not unhealthy, and is certainly a contrast to the Zanzibar coast, if we may judge from the tanned healthy traders who return.

"I have the honour to be, Sir, your most obedient servant,
(Signed) "JOHN KIRK."

The PRESIDENT further explained, with reference to these letters, that the one to the Earl of Clarendon had only been received since the meeting began. The affectionate letter from Livingstone to the President, consisting of ten or twelve pages of very small writing, was received only just before the meeting, and there was no time to select any details of interest which it might contain. He could not conceive of heroism more perfect than that shown by his illustrious friend in the midst of privations and hunger, here and there having to wade through rivers, and deserted by his attendants. The little paragraph at the end was a very amusing one. Sir Bartle Frere had also received a letter, and would, probably, give the meeting some account of it.*

Sir BARTLE FRERE said his letter went over very much the same ground as that to Lord Clarendon. Dr. Livingstone was under the impression that he (Sir Bartle Frere) was still in India, and had therefore sent him a letter to Bombay in order to diminish the risk of the information being lost. There were also in his communication a few remarks of a private nature relating to some members of his family, but of course it was not intended that they should be made public. In his letter he dwelt rather more fully than in that to Lord Clarendon, upon the feeling which was present in his mind that perhaps in seeking to solve a geographical problem he might be going away from what had been the pursuit of his life, the civilization and welfare of Africa in general. He (Sir Bartle Frere) felt sure that for once in his life Dr. Livingstone was wrong, and that, whatever directions his efforts might take, it was impossible for him to labour for anything but the good of mankind.

Mr. FINDLAY said, when Lake Tanganyika was first discovered, many difficulties were suggested against its flowing into the Nile, but there were also many difficulties attending any other solution of the problem. The theory was that a river ran into the south end and another into the north end, but its waters were perfectly clear and fresh, and there were no marks of any great accession of water. Then in what direction could the outlet be? When Speke and Burton arrived there they were in a wretched condition, the former being blinded and the latter paralysed. They heard that a river ran into it, but from the difficulties of the language they were not at all sure of that. Captain Speke, when he first mapped the neighbourhood down, had the impression that there was an open valley running northward. They had only one observation for level, and that gave the elevation 1844 feet above the sea. That was a very low level to carry it on to the Nile, which was a considerable distance

* A copy of this letter was afterwards communicated by Sir Bartle Frere, and is printed above, No. 4.

away. However, he (Mr. Findlay) was now gratified to find that his own conjectures were likely to be verified. The observations of Sir Samuel Baker, carefully compared with those of Speke, had since proved that 1000 feet must be added to Captain Speke's calculations, making the elevation 2800 feet. Thus it appeared that the two lakes, Tanganyika and Albert Nyanza, were on the same level. There were several difficulties connected with any other solution. On the western side of the lake high mountains were said to extend for a considerable distance. This shut out the idea of its flowing in that direction. On the eastward there was no outlet either. The rocky nature of the country forbade the belief that the Congo afforded an outlet. Then, again, the French had shown that the Ogobai was one of the most gigantic rivers of Africa, and it was possible that the Kija Lake might flow into it. He contended that the chains of mountains in that region were meridional, and that the waters of Africa ran in a northerly direction. In the course of a few months he hoped the great question would be settled. If his opinions should prove to be true, the ivory traders would in all probability prefer the Nile route to the present one to Zanzibar.

Mr. Francis Galton said it might seem strange that there should be an error of 1000 feet of altitude suspected in the observations of an explorer. Here, in England, levels were made to an inch, but the method of operating in uncivilized countries was quite different from that employed at home. Instead of using a spirit-level, and taking sights, the traveller in Africa had to boil a thermometer, that is, plunge it into boiling water in order to see at what temperature the water was. At the top of a high mountain, such as Mont Blanc, the temperature of boiling water would be insufficient to boil a potato. One degree of temperature corresponds to 500 feet in height; two degrees of temperature would be 1000 feet. The thermometer that Speke used, his others having been broken, was neither more nor less than a bath thermometer, and could not be depended on to a couple of degrees, especially after it had been taken a long journey in Africa and exposed to a dry climate. Even the glass of the best thermometers, after being often put into boiling water, becomes altered in structure, and the instruments change their boiling-point. Consequently, with an untested wooden thermometer, such an error as Speke had made was a very small matter.

Mr. Findlay said he had seen a pencil memorandum by Captain Speke to the effect that when he got to the coast again his thermometer boiled at 214° which was two degrees too high. Thus the error was easily accounted for.

The Rev. Horace Waller said that the frequent recurrence of the name Zambesi was accounted for by the fact that the word meant the "Washer," and was applied in many instances to rivers liable to high floods. Chambeze was merely a dialectic variation of Zambesi.

Captain Sherard Osborn thought it was a matter for congratulation that there was a prospect of Dr. Livingstone being met with and relieved by Sir Samuel Baker. He had always differed from the President in believing that if Livingstone did reach waters flowing north he would follow them down to the Nile and come out at Alexandria, and he still adhered to that opinion. It will be a great day when the two celebrated travellers meet, and the man who has discovered the sources of the Nile southward of the lakes will joyfully hold out his hand to Sir Samuel Baker who traced the Nile up to those lakes.

The President said by this time probably the whole question had been determined, but if the connection between the two lakes was proved he could see no reason for Dr. Livingstone's return by the Nile. The equatorial region had been already traversed, and he could gain no glory by following in the footsteps of Speke, Grant, and Baker. The road to Zanzibar was short, and he would no doubt prefer to return by that route. However this might be, the President was certain that when Livingstone returned home he would receive a more glorious welcome than was ever before given to a British traveller.

Second Meeting, November 22nd, 1869.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Colonel H. J. Warre*, C.B.; *F. K. Munton, Esq.*

ELECTIONS.—*Keith E. Abbott, Esq.* (H.M. Consul-General at Odessa); *John Buckley, Esq.*; *Lieutenant W. J. Cuthbert-Boteler*, R.N.; *Henry A. Churchill, Esq.* (H.M. Consul at Zanzibar); *E. B. Eastwick, Esq.*, F.R.S., M.P.; *Captain Henry Fairfax*, R.N.; *Captain Edward Boyd Fawcett*, M.A.; *James Gallie, Esq.*; *Dr. John Harvey*, LL.D.; *William W. Howard, Esq.*; *Theophilus Horrez, Esq.*; *Captain David Hopkins*; *Alexander Keith Johnston, Jun., Esq.*; *C. W. Ligar, Esq.* (Surveyor-General of Victoria); *Alexander Matheson, Esq.*, M.P.; *Albert Müller, Esq.*; *Colonel Francis Cornwallis Maude*, R.A., V.C., &c.; *Lieutenant George F. Purdon*, R.N.; *Iltudus T. Prichard, Esq.*; *Edward Rae, Esq.*; *George Russell, Esq.*, M.A.; *William Summerhayes, Esq.*, M.D.; *F. F. Searle, Esq.*; *George C. Silk, Esq.*; *Robert Sutherland, Esq.*; *Charles Waite, Esq.*, LL.D.; *Ebenezer Whytt, Esq.*; *Captain Charles W. Wilson*, R.E.

ACCESSIONS TO LIBRARY FROM THE 8TH TO THE 22ND NOVEMBER, 1869.—'Ueber das Verhaltniss der Topographie zur Geologie.' Von J. M. Ziegler. Donor, the author. 'Queensland and her Gold-fields.' By Charles H. Allen. Donor, the author. 'Surveys for the Kansas Pacific Railway.' By General W. J. Palmer. 1869. Donor, the author. 'Trade of the Upper Yangtze:' Report of the Shanghai Chamber of Commerce. Donor, Mr. Consul Swinhoe. 'Hypothetical Phœnician Names of Places on European Coasts,' in MS. By S. M. Drach. Donor, the author. 'Brazil: its Commerce, &c.' By W. Scully. Donor, the author. 'Der Minenbetrieb in Bolivien und der Brasilien, &c.' Also 'Die Deutsche Auswanderer.' Von J. I. Startz. Donor, the author. 'Fragmenta Phytographiæ Australiæ.' Contulit F. de Mueller. Melbourne, 1867-8. Donor, the author.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF NOVEMBER 8TH, 1869.—A Chart of the North Atlantic Ocean, showing the Tracks of the Telegraph Cables between Europe and America. 5 copies. Presented by Captain S. Osborn, C.B., R.N. Switzerland: a Map of Canton of Glarus. A Gelogical Map of Jerusalem and its Environs, compiled from the Ordnance Survey, under Captain C. W. Wilson, R.E. A Topographical Map of Jerusalam and its Environs. By the same. Map of the Island of Teneriffe. By Messrs. G. Hartung, &c. &c. Map of the City of Guatemala, Central America. By N. F. Y. Donzel. Ordnance sheets, 420 in number.

Previous to the commencement of the ordinary business, the President addressed the Meeting as follows, on the subject of the Faraday Memorial:—

"Before we proceed to the ordinary business of this evening, I beg to perform a duty which I have undertaken most heartily. When the world of science was deprived of that illustrious man, Michael Faraday, I was honoured by being named one of those Presidents of Societies who were appointed to organize the public meeting which was presided over by his Royal Highness the Prince of Wales, and at which it was resolved, in this very theatre, to erect a statue in memory of the great philosopher, in the Cathedral Church of St. Paul.

"On that occasion the feeling in favour of this resolution was strong and unanimous, and the object was most eloquently sustained by the eminent French chemist Dumas, one of the Perpetual Secretaries of the Institute of France.

"I regret to say, however, that at this moment the subscription-fund must be considerably increased, to enable us to pay for a suitable monument in marble by an eminent sculptor.

"As one who learnt his first lessons in science under Faraday, and who, in every succeeding year, admired more and more his great genius, as well as the simplicity and benignity of his character, I call upon you, my associates of the Royal Geographical Society, and your friends who may not have subscribed, to do honour to yourselves by supporting this good cause. In doing so, I beg you to recollect that it was in this very theatre that Faraday delighted and instructed vast audiences for upwards of 30 years; and that in this theatre, so adorned by him, we Geographers have now the privilege of holding our meetings, owing to the liberality of the President and Managers of the Royal Institution.

"Subscriptions for the Faraday Memorial are received by the Assistant Secretary of the Royal Geographical Society, and also by the Accountant of the Royal Institution."

The following paper was read:—

Notes of a Journey to the New Course of the Yellow River in 1868.

By Ney Elias, Esq., F.R.G.S.

[Extracts.]

It is well known that the Lower Yellow River, flowing through the great eastern plain of China, has many times changed its course during the historic era. No less than nine such changes are recorded by the Chinese as having taken place during the last 2500 years; the first dating about 602 B.C.,* and the ninth, 1851-3 A.D.; the positions of the mouths resulting from them having ranged over an extent of coast-line comprised between some 5 degrees of latitude. Thus the most northern is recorded to have been in about latitude 39°, which would coincide approximately with the present mouth of the Peiho; whilst the most southern is represented to be that which existed before the last change, and which is marked on all modern maps in latitude 34°. There is reason, however, to believe that

* See 'Geological Researches in China, &c.,' by Raphael Pumpelly.

this southern mouth was the outlet at some periods of only a portion of the Yellow waters, another portion finding its way simultaneously still further southward, viz., through the Hung-tsze Lake into the Yang-tsze, which, as will be shown below, is the case at the present day.

The causes of the earlier changes, their dates, and other details, I will not go into here, but will limit myself to a few remarks on the last diversion, and the resultant course.

This diversion was first brought to the notice of foreigners in China by Dr. Macgowan in the 'North China Herald' of 3rd January, 1857, and was ascribed hypothetically to various causes, all of which have been shown by the late examination to have had little or no connection with it.

The date of the occurrence was, for some time, a matter of uncertainty; some authorities placing it in 1851, others in 1852 and 1853, and even later. But, on a short journey, which I made in 1867, to Tsiu-kiang-pu, and the neighbouring portion of the old bed of the Yellow River, I was enabled, after questioning numbers of different persons living in the vicinity, at different times and under different circumstances, to ascertain with, I think, some certainty, that the change was gradually accomplished, and extended over the years 1851 to 1853.

This information was corroborated on my last journey, and might be summed up somewhat as follows. During the summer flood of 1851, the first rupture took place in the north bank, near Lan-yang-hsien, in Honan, and a portion of the water flowed through the breach on to the plain; the flood of 1852 extended the breach, and further diminished the supply on the lower river, and that of 1853 enlarged it to such an extent as to allow the whole body of water to flow over the lowlands to the northward and eastward, until it found a channel in the Ta-tsing River, which conducted it to the sea in the Gulf of Petcheli.

Thus, not until after the flood of 1853, can the new course be said to have wholly established itself, and the old one to have become entirely dry.

This new course having become a subject of interest to a portion of the foreign community of Shanghai, it was decided, in the early part of last year, to send an exploring party to examine and lay it down; all information upon it received up to that time having been of a vague and unsatisfactory nature.

In accordance with this decision, I had the honour of being requested to undertake the task, and my plan for carrying it out being approved of, a small party was formed for the purpose, consisting of Mr. H. G. Hollingworth, two Chinese, and myself.

The plan of the journey was to go to Chinkiang by steamer, from there to proceed up the Grand Canal until reaching the Yellow River; to follow the river down to the neighbourhood of its mouth in the Gulf of Petcheli, and up again as far as the point where it diverges from its old course (which was reported to be near I-fung-hien, in Honan), returning by the river and Grand Canal to Chinkiang. This plan, having afterwards been found practicable, was carried out.

As most of the rivers in China are known to be in flood during the summer months, and consequently in an unfavourable state for exploring operations, and as those in the northern districts are generally frozen over by about the middle of December, the autumn was considered the most advantageous season for the journey, and consequently the party started from Shanghai on the 24th September.

A journey of nearly 400 miles on the Grand Canal brought our party, on the 17th October, to the southern bank, or rather "limit," of the new Yellow River, near a small but busy town called Nan Shan. The river, at this point, has no defined bed, but flows over a belt of country some ten to twelve miles in width, having merely the appearance of a flat level district in a state of inundation.

Along this fifteen miles the canal banks have been carried away in a number of places by the Yellow River breaking across them. The gaps are sometimes half-a-mile or more wide, and the current rushing through these almost obliterates the course of the canal, and renders navigation upon it difficult.

For dreariness and desolation no scene can exceed that which the Yellow River here presents, everything natural and artificial is at the mercy of the muddy dun-coloured waters as they sweep on their course towards the sea—a flood not likely to subside, and a doubly mischievous one, from the fact of its ever moving onwards with a swift current.

The Grand Canal is now dry, from the Yellow River northwards, as far as Lin-tsin-chow; or, in other words, it ends there, that portion north of the summit-level being merely a tributary of the Yellow River. During the two months of the year, however, when the river is in flood and at its highest level, enough water, it is said, flows into the dry bed of the canal to form a navigable stream as far as Lin-tsin, where it connects with the Wai-ho. Thus, for some ten months of each year, there is no water-communication towards the north beyond the Yellow River.

Near the southern "limit" of the river is a channel running in a general N.N.E. direction, down which junks of a considerable size were seen to be sailing. Being informed, however, that a more important

one existed near the northern "limit," it was decided to cross at once and commence the exploration by this latter channel, leaving the southern one until a better opportunity should offer. Having crossed accordingly to Pa-li-miau (a small village 8 li from Chang-tsin), that place was made the first station, and, the necessary observations for fixing its geographical position being obtained, the journey down the river was commenced from there on the 20th October—a date, by the way, so far advanced in the season as to render the greatest expedition necessary in order to complete the journey before the closing of the river by ice.

After sailing down the northern channel for about 19 statute miles a point is reached, where it is joined by the southern one, and consequently, also, by all the water which higher up floods the country lying between the two. This point is called Yü Shan, and the deep, narrow, clean-cut river-bed that receives the converging waters and leads them to the sea, is that which, 15 years ago, formed the course of the Ta-tsing.

Proceeding down-stream we pass through an open, well-cultivated country, with every here and there low dome-shaped hills, sometimes detached, sometimes in groups, and backed up by a range some 400 to 600 feet high, running nearly east and west.

Fifty-six miles from Yü Shan, by the windings of the river, bring us now to the town of Tsi-ho-hien, on the old main road to Pekin, which crossed by a bridge. The bridge was swept away when the Yellow River broke into the Ta-tsing River. It is a small newly-walled unbusiness-like looking place, which, except from the circumstance of its being the site of a serious obstruction in the river, would hardly call for a word of notice. This obstruction consists of the ruins of a stone bridge of some seven arches, which at one time spanned the Ta-tsing, but which would now reach only about three-quarters of the distance across the river. There is a space between one extremity of it and the left bank, of about 100 yards, which is used by boats as the only navigable channel. The deepest portion of this 100 yards is close under the left bank, where at the time our party passed down (Oct. 21st), there was a depth of 5 feet, and no stones to be felt with the lead. The outer portion of the 100 yards channel, however, would probably not be practicable even at 3 feet.

The bridge evidently stands in deep water, six fathoms having been found immediately above it, and five a few hundred feet below it; the right bank is the steep one, and the left, near which is the channel, the shelving one, and naturally the shallow side of the reach. Its being now nothing but a wreck is, of course, due to

the additional force and volume of water in the river for the last fifteen years, which it has been unable to withstand.

It is evident that the ruins of this bridge might be removed, and, if no other obstruction existed, the river rendered navigable as far as Yü Shan, or within 19 miles of the Grand Canal. Unfortunately, however, about 3 miles below this one, there occurs another, though a less formidable obstruction, in the shape of a shoal extending right across the river. In this case, too, the deepest side of the reach is the right, and here, on the 21st of October, only 11 feet was found, the bottom rising gradually towards the left bank. On the 6th November, when this spot was passed a second time, there was but 5 feet of water in mid-stream, and allowing for the fall since the 21st of October, we should have only about 6 or 7 feet in the deep passage near the right bank. The length of the shoal would be about 200 to 300 yards, and is the only place above the bar where less than 2 fathoms was found in the deep channel.

The next point of interest we arrive at is Lokau, the port of Tsi-Nan-Foo, a long straggling unwalled town on the right bank. Tsi-Nan itself stands 12 li from the river, and not far from the foot of the main range of hills, which hereabouts average probably from 800 to 1200 feet, and form a rather picturesque background to the low, thickly-wooded plain upon which the city is built, and which extends for many miles on both sides of the river, giving to the country its characteristic feature of flat lowland. This plain is essentially alluvial, yet there rise from it in this neighbourhood several small wedge-shaped, jagged hills, or rather masses of rocks, in some cases heaped up into fantastic shapes, and the fragments near the bases worn into rounded boulders by the action of water.

Their height is inconsiderable, but being perfectly isolated, sometimes several miles of plain intervening between two of them, or between one and the main range, stamps them at a glance as the direct result of igneous action.

The trade of Tsi-nan-Foo is said to be of great importance; but, as a large proportion of it is carried on by means of cart-roads a traveller on the river has but little opportunity of forming an opinion of its magnitude. The number of boats seen at Lokau was not large, and many of them appeared to be only passing through towards the Grand Canal. The only article of commerce noticed in any quantity was salt, which had come up the river from Tié-mên-quan. Coal is met with as an article of trade, both here and at other places on the Yellow River, and is used for cooking and other purposes to, I believe, a considerable extent; it is of a rather

bituminous nature, and is sold at the rate of 1200 cash per picul in Tsi-nan-Foo. The principal mines are said to be at Tsanfan, a place in the hills 90 li to the eastward, where the coal is sold at a very much lower price than at the city.

We pass on now through a thickly wooded, well-cultivated country for about 150 miles, flat, but dry, and the soil very light and friable. The river's banks are steep, and indicate a rise in summer of 8 to 14 feet, according to the distance from the sea. The re-entering angles are everywhere much eaten into by the current, and large masses of soil are continually falling away. In many places the grain of this year having been sown up to within a short distance of the water, portions of the fields supporting the crop already sprouting have been undermined, and fallen into the stream below; thus showing that the undermining process is a very rapid one, probably more rapid this year than the experience of the inhabitants who sowed the grain led them to anticipate.

The graves near the river, or rather the coffins from them, have generally been removed to some distance back, and often to the opposite shore; the exhuming and removal being sometimes attended with great ceremony.

A few miles below Li-tsin the country begins to change its character; the well-wooded and well-cultivated district above described giving place to boundless tracts of mud and marsh, but poorly cultivated and thinly inhabited, and the whole aspect one of a bleak, swampy, treeless waste, scarcely fit for man to dwell in. Nevertheless, on the river's banks are villages, at short intervals from one another down to within 20 miles of the sea, which causes the traveller on the water to form an exaggerated opinion of the population of the district, though he is easily undeceived by walking a short distance away from the river, when it becomes apparent that on the whole the population is sparse. In fact, the only fairly habitable region is that belt of land immediately skirting the river, and from which the water of the annual flood drains itself off naturally, whilst on the tracts lying farther back it is either absorbed by the soil or remains on the surface in the shape of marshes and ponds, rendering habitation without artificial drainage almost an impossibility, except on a most limited scale.

At the limit of the habitable region, viz., about 20 miles above the sea, by the windings of the river, stands the village of Tiē-mên-quan, the port of the Yellow River; and though only a village, composed like others in the neighbourhood of mud-built houses,

it has every appearance of being a most important place. It is not a centre of trade, but consists chiefly of hongs, to which traders from the different towns in the neighbourhood come to transact their business; and during the winter months, when the river is closed by ice, it is said to be nearly deserted. Now, although it is called a port, Tiĕ-mĕn-quan is only used as such by small Pei-ho and Yellow River junks. Larger vessels, such as those from Ningpo, Shanghai, Lwataw, &c., never come within 20 or 25 miles of it, but remain at an anchorage outside the bar, called Tai-ping-Wan,* where they discharge their cargoes into Yellow River boats, receiving their homeward freight by the same means; thus, for these junks, Tiĕ-mĕn-quan can scarcely be considered a port.

The direct trade which exists between places high up the river and Tien-tsin, Chefoo, and other ports on the Gulf, is carried on by boats of a lighter draft, and of a different construction to the sea-going junks of the southern provinces; but well suited, of course, to the rivers and shallow seas on which they are employed.

The voyage to Taku is said to occupy these boats about two days with a fair wind, that to Chefoo about four days. In both cases the journey is performed by coasting round the Gulf, and as the water for some distance from the shore is very shallow, the sea never rolls heavily, and it is always possible to anchor in the event of a foul wind.

The principal trade of Tiĕ-mĕn-quan appears to be with Tientsin, which is the nearest open port, though junks, bound to and from all parts of the Gulf, are to be found there.

Tiĕ-mĕn-quan, as before remarked, is on the lower limit of the habitable and salt-producing region. The country between it and the sea is an uninhabitable region—an immense mud-flat, stretching away on both sides of the river as far as the eye can reach; in the summer and autumn the greater part is covered with reeds, the more accessible of which are collected for fuel by a race of miserable reed-cutters, whilst the rest afford cover to vast numbers of wild fowl—swans, geese of two kinds, pelicans, &c. In the winter, when the reeds are gone, it must be a desert of mud, and when the river is in flood it is of course totally submerged. About 12 miles below Tiĕ-mĕn-quan and half a mile from the river's left bank is a little knoll, about 10 feet above the general level, formed of sea-shells and *débris*, evidently at one time an island, and upon which stands a small brick

* "Quiet" Haven, or Bay. Anything drawing 10 or 12 feet can get over the bar at springs. "Quiet" or "Repose" Bay has 30 feet of water, a very good holding-ground. The land is not visible from it; but I believe a house and a tree can be seen.

joss-house, apparently new, and a few mud-hovels, the dwellings of reed-cutters. This place is called Lau-Ye-Miau—the only habitable spot for many miles in every direction—and is probably the point reached by the naval surveyors in 1860, and called by them Miau-Shing-pu. About 4 miles below this again we come to the bar—an object that has excited a great deal of interest amongst residents in China, it having been thought that the navigability of many hundreds of miles of the Yellow River hinged upon the depth of water to be found there. This view, however, as will be seen immediately, is not a correct one, worse obstructions existing higher up. At the date I visited it, October 27th, the least depth found was about 5 feet near the middle of the river, the water at the time being, according to the pilot who accompanied me, about a foot or 18 inches above low-water mark. The deepest channel is near the right bank, though there is one almost as deep near the left, the shallowest part being in the middle. In the former I found about 9 feet, and in the latter about 7 feet, which, at low-water springs, would give little over 7 feet and 5 feet. Several junks, drawing, it was said, 2½ feet of water, were seen sailing through the left channel. The range of the tide would appear, on the average, to be about 2 feet—rather more at springs and rather less at neaps. Ordinary neap-floods, when the river is not in flood, are said to be perceptible for about 20 or 30 li above the bar, and springs, when favoured by the wind and a low state of the river, are sometimes noticeable as high up as Tiĕ-mĕn-quan, some 60 li above it. It is, of course, obvious that a sufficiently long stay to make personal observations on the tides was impossible.

After returning to Tiĕ-mĕn-quan from the bar on the 28th of October, our party had thus far examined only the section of the river included between the Grand Canal and the sea, and there still remained that portion above the Grand Canal to be explored. It was already late in the season, and before us was a journey on the Yellow River alone of some 550 miles, upwards of 400 of which was to be performed against a strong current, and in a craft scarcely suitable to the navigation. Every effort, therefore, was made to push on as rapidly as possible, and no special halts were made for any purpose, except a short one for longitude observations, until arriving at Pa-li-miau, on the Grand Canal (our first station), on the 10th November.

The river here, as before noticed, has no defined bed, but presents the appearance of a belt of country, 10 to 12 miles broad, in a state of flood—trees, ruined villages, and patches of bare mud, being all that is left of a once fertile and prosperous district. We have already

seen that this is the aspect of the river for 19 miles immediately below the Grand Canal, viz., as far as Yü Shan; and in proceeding up-stream we find another 76 miles (more or less, according to the season) of a precisely similar character, making in all a section of 95 (stat.) miles, scarcely worthy of the name of a river. Bed there is none, and at some periods of the year scarcely a channel for boats of a moderate size. It is true the natives speak of two channels, and indeed use them—a northern one and a southern one; but both were gone over during the month of November, and when I say that our boat, drawing only 15 inches of water, had often difficulty in finding a passage, little more need be said concerning the practicability of this portion of the Yellow River.

During the high-water season, junks, drawing, it is said, as much as 3 or 3½ feet, can use the southern channel; but the journey is slow and laborious in the extreme, and whole days are frequently spent in kedging over shoals, or through places where the deposit, having found a group of trees or some other object to silt against, has commenced the formation of a mud-bank.

That there can be no great depth in this lagoon-like section of the river, is at once apparent when we consider that the same volume of water which, lower down, is contained between the banks of the narrow Ta-tsing, is here spread out over a belt of country ranging from 10 to 15 miles in width. Had this belt at any time been the site of a fairly deep river, or even a deep-dug canal, the water of the Yellow River, although at first of too great a volume to be contained in the bed of such river or canal, would, in time, have so enlarged it by means of its scouring power as to have rendered it of the necessary capacity. This, indeed, is what took place in the case of the Ta-tsing; for, as we have already seen, the bed of that stream has become both deeper and broader since the advent of the Yellow River, and now contains the whole of the latter's waters in addition to its own, and only overflows its banks at the height of the flood season. Above the Grand Canal, however, there was no river-bed of sufficient size to form the basis of a course for the Yellow River, and hence the wide-spread shallow flood instead of a defined stream.

There were, it is true, two small canals falling into the Grand Canal within 7 miles of one another: the more southerly of these, the Lun-kiang, was a very small one, only 90 li long, it is said. A portion of it was examined, and the banks in some places found to be hardly distinguishable, but everywhere the waters of the Yellow River stretching away like an overflow on both sides. To judge by the ruins of bridges, houses, and "pylams," the region through

which it flows must have been a prosperous one. At present, a few mud-and-reed hovels are the only habitations; and a few patches of wheat, sown on the mud-banks left temporarily dry by the yearly recession of the waters, the only signs of cultivation.

The second or northerly canal was of much more importance than the Lun-kiang, and, though shallow and narrow, was about 400 li (133 miles) in length. It was, and still is, called the Chau-wang-ho, and led from the old Yellow River to the Grand Canal near Pa-li-miau. The point of junction with the old Yellow River I have never been able to ascertain with any certainty; but I believe it to have been a short distance to the east of the place now called Lung-mên-kau, or the breach in the river's bank through which the Yellow waters leave their former bed. It presents, on the whole, much the same appearance as the Lun-kiang, viz., an embanked watercourse running through an inundated country. Its artificial banks were at one time at some little height above the level of the country, but they have now in most places been either carried away by the floods or worn through by the current of the Yellow River. The villages and bridges are mostly in a state of ruin, and the latter, as they reach now little more than half-way from bank to bank, are additional evidences of the power of the river to form for itself a bed, provided only that it finds a sufficiently durable basis to work upon. Durability in that case, however, is wanting; and even had the Chau-wang been many times its original breadth, it would still have been useless as a channel for the Yellow River, the artificial embankments being naturally unfitted to withstand the scouring process. As it is, the canal is only traceable here and there for a few miles at a stretch; and, as its course through the belt of country at present occupied by the river was a winding one, the portions now left are, as it is only natural to suppose, those whose direction was identical, or nearly so, with that taken by the Yellow River.

A distance of 76 miles, then, by the southern channel, from the Grand Canal, brings us to a point where we find the Yellow waters again flowing in a defined channel, which is traceable as far as the old bed, a distance of about 52 (statute) miles. At the low-water season this channel contains the whole Yellow River; but as the banks in the highest places are no more than about 10 feet above the November level, it can contain during the flood season only a portion of it.

Now, although when the banks are at 10 feet above the level of the water this channel has the appearance of being the permanent bed of the river, yet, so far from thinking it permanent, I should

hesitate even to call it a "bed" at all; for the banks—and, indeed, the country for miles on each side—are composed of the river's own deposit, which seems rather to have silted to a certain elevation above the river-level than that the water had cut a bed for itself in the soil to a corresponding extent.

Between the point at which the Yellow River changed its course and the Grand Canal the land must be very low relatively to the sea-level. At the time of the change, and in some subsequent severe floods, many villages far inland were buried by the deposit up to the eaves of the roofs. In some places the deposit is silicious sand, and in others an impalpable yellow earth. It sometimes improves and in others deteriorates the pre-existing soil.

It is almost superfluous to say that the country thus formed of the river's deposit is a perfect level, and that the soil is very light and mobile; and though the flood of each successive year, by adding more deposit, increases the stability, yet a powerful stream like the Yellow River can, I imagine, hardly be thought to have adopted a permanent course when the nature and height of its banks, the character of the adjoining country, the extent of its annual overflows, &c., are taken into consideration.

Perhaps the most striking proof that the banks and neighbouring country are the creation of the river's deposit rather than that the channel is a natural excavation, is that of the buried or silted-up houses, which, besides, is a circumstance of interest in other respects: as, for instance, that it goes to show the power of the Yellow River in changing the configuration of the country with which its waters come in contact. The houses are frequently silted-up nearly to the eaves, and have generally been abandoned; but few dug out. As an example of this I may mention a joss-house, within a few yards of a point on the river where the level of the deposit was some 10 feet above that of the water. To enter this joss-house it was necessary to crawl under the eaves, and, when inside, it was evident from alterations that had been made in the doorway, &c., that for some time the inhabitants had attempted to accommodate themselves to the constantly diminishing height of the building. The severe floods are not annual: one took place about 1855, and the next about 1862 or 1863.

So little used is the Yellow River above the Grand Canal, and the navigation on it so little understood, that the people living near its banks, and even the boatmen themselves, seldom know the distance from one place to another by the river, but always speak of distances by the road, and even then two rarely agree, showing of what little importance the river is regarded as a means of com-

munication, even though no roads worthy of the name exist in its neighbourhood.

A somewhat tedious journey of a fortnight from the Grand Canal, brought our party, on the 24th November, to Lung-mên-Kau, the diverging point of the old and new courses of the Yellow River, and the upper limit of the exploration.

The breach in the embankment of the old river is about a mile in width, and the present channel runs, as it were, diagonally through it. The two banks at this point are about three miles apart; near the northern one there is a depression about a quarter of a mile broad, full of small sand-hills, the only part of the old bed having any appearance of a dried-up watercourse; this was the main, or low-water, channel of the old river, the artificial outer embankments marking only the limit attained during the annual floods.

By a mere cursory inspection of the neighbourhood of the breach, the cause of the Yellow River's change of course is at once apparent. The river had so diminished the capacity of its bed (which, by the way, was always an artificial one) by depositing the alluvium with which its waters were charged, that the main pressure during the flood season had come to bear on the upper, or weaker, part of the embankments; and no measures having been taken to strengthen these, or deepen the channel, the great catastrophe happened, which, with its consequences, had been predicted by the Abbé Huc some years before—a catastrophe which has caused not only the devastation by flood, of that line of country through which the river now flows, but has also impoverished to such an extent the districts through which it formerly flowed, and which were dependent upon it for irrigation, as to render them almost uninhabitable, and to throw a great portion of the population out of employment.

Lung-mên-Kau is a small village built along the north bank of the old river east of the breach. About 90 li w.s.w. of it stands Kai-fung-fu (or Pien-liang-ching, as it is more generally called), the capital of Honan. A road leads down the old bed, through Lan-I towards the south, and boats bringing cargoes down the river sometimes discharge them at Lung-mên-Kau for conveyance by waggon to towns in that direction. Some of these boats bring small quantities of good anthracite coal from the neighbourhood of Hoai-king-fu.

After leaving Lung-mên-Kau, the river was followed down as far as the Grand Canal, which was reached on the 30th November. It had been intended, as before remarked, to have examined the channel which leads from Nan Shan (on the Grand Canal) to Yü

Shan, and runs near the southern "limit" of the river; but the fall of water had been so great since the first view of this channel was obtained on the 17th October, that it had become impracticable for all but the smallest boats; and, seeing that the ice had already begun to form on the shallow waters of the river, it was thought advisable rather to leave this channel unexamined than incur the risk of being frozen in, and having to transport the time-keepers overland.

At Nan Shan, therefore, on the 1st December, the exploration came to an end, and the party, returning by way of the Grand Canal, arrived at Chinkiang on the 15th December.

To sum up shortly the capabilities of the Yellow River for navigation, it would seem that a vessel of sufficiently light draft to cross the bar would have no difficulty in ascending the river during all but the lowest point of the season as far as Tsi-ho, a distance approximately of 210 statute miles from the bar, and were the ruins of the bridge at that place removed, a further distance of 56 miles would be rendered navigable, making in all 266 (stat.) miles from the bar to Yü Shan. All beyond Yü Shan, as far as Lung-mên-Kau, must be regarded as totally unnavigable, except perhaps the 19 miles between Yü Shan and the Grand Canal, which could be used during the high-water season.

The yearly rise or fall is greater in some years than in others, but taking the November level of last year (1868) as a base, and judging of the former by the indications of the banks and other signs, and of the latter from native information, I should think that a yearly range of 20 or 22 feet would not be far from the mark. Both rise and fall take place very irregularly, and it is said that a fall of three feet in one day is a common occurrence, especially towards the approach of winter.

As in the first paragraph of this paper, mention was made of a southern outlet of the Yellow River existing at the present day, it must be explained here that this was caused directly by a rupture of the south bank of the old river near Yan Kiau in Honan, about 150 li above Kai-fung-fu, which occurred in July last (1868).* Not having visited the spot, my information on this subject is, of course, derived from the natives, who report that the bank is carried away for about 3 li, and that the water of the Yellow River flowing through the breach floods a large tract of country outside the bank, and then finds its way into a small river called the Sha, a tributary of the Wai, which latter flows into the Hung-tsze Lake. It is said

* About 1843 a breach occurred in the south bank still higher up, and is spoken of as one of the premonitions of the late change.

that the authorities are trying to repair it in time for next summer's flood, about a third of the work being finished in November; and the common belief is that when the upper one has been closed, the lower one will be taken in hand, and the river made to flow along its old course to the sea.* This, however, would appear to be impossible as long as the old bed remains at its present level, and to deepen it or to raise the embankments would be equally impossible in the present disorganised and impoverished state of the country. On the 22nd November, while proceeding up the Yellow River, I had a corroboration of the statements of the natives regarding communication with the southern waters, by meeting five or six Hung-tsze boats, whose people said they had come from Ying-Chow (or Hing-Chow) in Kiang-nan, by way of the Sha. These boats were said to draw about 1½ foot of water, but as they were dropping down with the current no information could be obtained concerning the Sha, or the communication between the Yellow River and the Hung-tsze—a matter of great interest, as, should a permanent communication be found to exist, the Yellow River will have to be regarded as *in part* nothing more than a tributary of the Yang-tsze—for into the Yang-tsze the Hung-tze Lake discharges. The amount of water parted with through the new breach I believe to be very inconsiderable.

The paper will be published entire, with the author's chart, in 'Journal,' vol. xl.

The PRESIDENT explained that the author of the paper that had just been read was a young man engaged in business in China, who had, in a most praiseworthy and energetic way, occupied his autumnal holiday last year in making this most interesting survey. The manner in which it had been carried out merited the most hearty commendation. Mr. Elias had drawn up the charts of the river exhibited that evening with his own hands, and had delineated many hundreds of miles of territory, gathering information respecting one of the most remarkable physical changes that had taken place in modern times.

Captain SHERARD OSBORN, R.N., said Mr. Elias had not only given an interesting account of the new course of the Yellow River, but for the first time had presented geographers with an accurate map, with positions fixed astronomically and soundings throughout. Mr. Wylie had been the first to tell us of the fact of the old bed of the Yellow River being dried up; and, subsequently, Mr. Lockhart, in a paper read before the Society, had guessed, as it proved with accuracy, that the river had returned to one of its old beds, discharging its waters into the Gulf of Pecheli. These gentlemen had made us well acquainted with this part of the river-system of Central China. Recently, Mr. Swinhoe had ascended the Yang-tsze-kiang, with Admiral Keppel

* This would be no improvement, even if it were possible. The present course is more navigable, as above stated, for 200 miles, than it would be possible to make the other.

and two delegates from the Chamber of Commerce at Shanghai, 400 miles above Hankow, and they had forwarded excellent geographical information, combined with a great deal that was most interesting to the merchant and the politician, giving not only a description of the river, but of the products of that part of the country, which might be called the second plateau of the river-system of Central China. The first or lower plateau traversed by those magnificent streams Yang-tsze and Hoang-ho, consisted of the well-known alluvial plain, called the Great Plain of China, extending as far westward as Hankow and thence northward in a line towards Pekin. Its area, equal to that of France, in 1813 supported a population of 170 millions, and it was probably the richest region of the earth, so far as soil and products were concerned. Above the Great Plain was a second plateau, between the borders of China Proper and this Plain—a great *terra incognita* for the most part, so far as we are concerned. Captain Blakiston traversed it in a boat, and now the Shanghai merchants sent us more information. Athwart this second plateau the great rivers flowed swiftly, carrying the *débris* of the mountains down to the first plateau or great plain, formed of the rich alluvial soil thus deposited. But it was worthy of note that the large and rapid rivers which created and fertilized this plain required to be held in hand by the skill of the engineer. The Yang-tsze-kiang from time immemorial had been the means of communication across the empire, and it was to that river that Europeans were indebted for access into the interior of China. Parallel to it, and branching in all directions, was a perfect net-work of canals—the roads of China. The Hoang-ho had an entirely opposite character; it was as turbulent at its source as at its mouth, so that the people living on its shores hardly ever used it as a means of communication. Every traveller confirmed this account; but he thought, if European engineering talent were set to work upon this river, that we could utilise its waters. The Great Canal had gone out of repair from the general misgovernment of the country. The canal only required to be reconstructed, and the surplus waters of the Hoang-ho would again be made available. As far back as 1818 the Chinese censors pointed out how difficult it was to restrain this stream. He found, from Mr. Wade's papers, that in 1821 the river was maintained for a sum per annum, which by 1850 was quintupled, still the river could not be kept within bounds. The Hoang-ho—indeed all China—offered a field for the surplus engineering talent of Great Britain. It was a melancholy fact that, owing to the inundations of the Hoang-ho, as many as 40 or 50 millions of people had lost their lives in the last 15 years, yet mandarins talked of how their people would suffer if improved engineering works were introduced. Mr. Wylie had ascended the upper portion of the Yang-tsze from Hankow to Sau-chow, then made a considerable curve and struck the watershed of the Han, and came down to Hankow, traversing a most interesting region, interesting as being the original seat of the Chinese race. Mr. Swinhoe's elaborate report told us that, if the Chinese would only throw open the upper waters of the Yang-tsze-kiang as they had thrown open the lower, there was no doubt steamers could force their way up the rapids, and give us access to the magnificent province of Szechuen. He hoped the day was not far distant when the treaty made by Lord Elgin would be carried out in its integrity, for every step we made into China would be for the benefit of its people, and for the benefit of our own country as well.

The PRESIDENT said Captain Sherard Osborn had spoken on a topic which was really his own, for it was well-known that it was he who took Lord Elgin up to Hankow. As Mr. Wylie was present, and the paper contributed by him could not be read, owing to the shortness of time, he hoped that gentleman would make some observations.

Mr. WYLIE said Captain Osborn had correctly pointed out the route he had pursued from Hankow up the Yang-tsze-kiang as far as Sau-chow, and thence to the capital of Sze-chuen. Captain Blakiston had already described,

in his well-known work, the course of the Yang-tsze-kiang and its characteristics, as far as Sen-chow. At that point he (Mr. Wylie) left the Yang-tsze, and ascended the Min, a very considerable river, as far as Chingtu; there were, however, many shallows in it, and it was not fit for steam navigation. It would be needless for him to describe in detail the route he had pursued. He and his party travelled over the great plain of Chingtu, for some two days after leaving the capital. It was a mere mud-flat, principally paddy-fields, with a great traffic across it. This was succeeded by a range of low hills, over which they passed in several days' journey, and subsequently crossed a much higher range. They proceeded thence to the Han River, by which they descended to the city of Hanchung, a few miles above which the navigation of the Han begins. This is a very important river, inasmuch as at certain portions of the year the traders find it necessary to follow that course, instead of pursuing the navigation of the Yang-tsze-kiang, owing to the rapids and the rise of water in the gorges, which render the navigation of the latter at those periods difficult and dangerous. Ascending the Han as far as the district city of Meen, by a journey of about 40 miles over the hills, they reach the Kealing River, from which they again descend to the region of the Yang-tsze-kiang, and thus avoid all the gorges and rapids. He was exceedingly pleased to hear the good opinion expressed regarding the labours of Mr. Elias, who was a most conscientious explorer and a thoroughly reliable authority. In the course of his wanderings through China, he (Mr. Wylie) had on various occasions come in contact with the Yellow River. The first time was in 1854. Indistinct rumours had reached Shanghai with regard to the gradual diminution of the waters in the river. But on reaching the bank of the old channel, he was surprised to find that, instead of the mighty stream that used to flow there, it was entirely a broad, dry, sandy bed, traversed as a high road by innumerable passengers, and a most singular scene it was. He believed he was the first European to bear witness to that fact. To ascertain where the water was gone to was not so easy; so to speak, it had gone nowhere, but had scattered itself over a large tract of country, without settling into any bed at all, spreading desolation over many miles and utterly destroying a great number of towns, villages, and hamlets. About nine years after that, when on a journey from Tien-tsin to Chefoo, he crossed the waters of the Yellow River. Had it not been the depth of winter, and consequently the low-water season, he would have had considerably greater difficulty in getting through. He found the waters distributed over the country in lagoons and marshes; they had scarcely concentrated themselves into any regular channel, but were converging towards the Ta-tsing River. In consequence of the water spreading out, he had to diverge from the highway seaward, and even then met with a slight disaster at one place. When about three-parts over a broad sheet of ice, his cart getting on a thin place, went through, thus putting him for a time in an awkward predicament, until helped out by some casual passers, to whom such occurrences were apparently no novelty. Since then, the waters seemed to have become more collected and settled in one regular channel. Again, about three years ago, whilst on a journey from Hankow to Pekin overland, he had occasion once more to cross the Yellow River, directly north of the city of Kae-fung. The river there was a black, slow-running stream, about one-third of a mile broad. There was no traffic except that of the ferry-boats crossing it with a great number of passengers to and fro. The northern bank of the river was a long sandy slope, a mile and a half broad, so that in summer time, when the waters are high, the river must be very much broader. He believed there was never any great traffic along that part of the river. The paper which had just been read described the condition of the river at the present time. The name of that portion south of the Grand Canal, which Mr. Elias had given in Chinese, meant "the old Yellow River." So that it was actually a portion of the old bed which the river occupied before it flowed in the late channel

occupied previous to the one it had recently made. Mr. Elias seemed to hint that there was no security for the river remaining in its present position. There was another condition which might be noticed. It was asserted by the Chinese, and he believed it was confirmed by geologists, that the bed of the Gulf of Pecheli with the adjoining coast-line (and the mainland, to what extent from the sea is not known) was gradually rising at the rate of six feet in a century. This must exercise a great influence upon the course the river would take.

The PRESIDENT.—On what authority do you state that?

Mr. WYLIE said the Chinese stated so; and Mr. Bickmore, an American professor, who visited that part of the country last year, had stated that the bed of the gulf was rising at the rate of six feet.

The PRESIDENT.—As I understand you, the ground is rising very much in the Gulf of Pecheli. But this river, which we are hearing of now, has found its issue into that gulf which you say has been rising. I do not understand that.

Mr. WYLIE said this was what he read in the reports of geologists. They had heard of the changes that had taken place at various periods. Perhaps it might not be generally known that the lower portion of the bed that the river had lately occupied was actually the entrance of the River Wei; from the Grand Canal up to the sea-coast, it had actually usurped the bed of the Wei, and was still called the Wei by the Chinese on the spot. Since the closing up of its mouth the Wei had run into the Hung-tsih and other lakes bordering the Grand Canal on the west. Of late years these lakes have been gradually extending their dimensions in consequence; and as the natural outlet for their waters is the Yang-tsze River, it may possibly become a question whether the extension of the flood season about Hankow and upwards is in any degree attributable to such an influence.

Mr. LOCKHART expressed his satisfaction that the great work which he had so long desired had been accomplished, namely, the survey of the northern mouth of the Yellow River. Some years ago he read a paper on the subject before this Society.* Mr. Elias' investigations proved, what the Chinese had long asserted, that the Yellow River, during its frequent changes, had found its way most often to the north. The historical mouth of the Yellow River was the southern one, with which we were well acquainted, but the Chinese knew the river much better by its northern course. He might state that there was no river in the world that had been so much written about as the Yellow River. The histories of their rivers written by the Chinese were remarkable for the fulness of their descriptions and the accuracy of their maps. There had been some divergence of the various northern mouths, probably to the extent of 100 miles, to the northward, and a little to the south of the Ta-tsing River. The Yellow River had ever been the trouble of China: it had cost them many millions at various times, and it had often been called "The Sorrow of the Children of Han." When China was thrown more open to commercial intercourse, we might hope that our engineering science might be brought to bear upon confining that river within its own bed. As they had heard, it was bearing out its name in the present generation, many millions of people having been completely destroyed by the present irruption of the Yellow River to the northward. He also wished to say that, within the last few years, we have had some remarkable journeys undertaken by Englishmen in different parts of China. They had heard what Captain Blakiston had done; and he was proud to hear of the journey which his friends—Mr. Wylie and Mr. John—had made. It might be interesting to mention that Mr. Wylie believed he had identified the White Horse Pass which Marco Polo went

* Drawn up from information received from the Chinese, and also from Mr. Wylie, after his visit to the dry bed of the Yellow River in 1857.

through in one of his journeys in China. This would be a subject of interest to the President and to Colonel Yule. Journeys had also been made by Mr. Lees and Mr. Williamson to Sigan-fu, in Shensi, where they had seen the celebrated Christian inscription erected about the year 1200 A.D.; by Mr. Morrison, from Peking to Hankow, and by various consuls, merchants, and missionaries throughout the length and breadth of the empire.

Mr. Saunders wished to correct an inaccuracy in Mr. Elias' paper, and to allude to a previous journey to the new course of the Yellow River. Mr. Elias remarked that the new course of the Yellow River had never yet found its way into modern maps. He begged to say that it had done so in several maps that he was acquainted with; and that the information was derived from the journey of Mr. Morrison, son of the famous Dr. Morrison. He touched the new course of the Yellow River at various points by land, and effectually fixed its direction. Mr. Morrison had partly prepared a paper on his journey, but he had been unable hitherto to lay it before the Geographical Society owing to his feeble health.

The President congratulated the Society upon the importance of the discussion which had followed the reading of Mr. Elias' admirable paper. With regard to what had fallen from Mr. Saunders, no doubt it was quite right to render all honour to Mr. Morrison for what he had done; but no one, that he had ever heard of, had delineated the new course of the river as Mr. Elias had done. He agreed with Captain Sherard Osborn that the great internal water-communication of China was now much better known to us, owing to modern English explorers; and he could only add that, if there was any country in the world where civil engineers could be most successfully and serviceably employed, this was the region, where by erecting comparatively little mounds of earth they could deflect the channel of the rivers, and so materially affect the conditions of the whole surface of the country. The physical features of China under consideration, *i.e.*, those great alluvial plains which were the characteristics of the country, were chiefly due to the action of great rivers, and very slight deviations necessarily produced great changes in flat and undulating regions. As an old geologist, however, he retained his former opinion that the great alterations in the configuration of the earth's surface were brought about by causes on a very different scale indeed from those which operate now. The physical changes which were taking place in China, though considerable in extent of surface, were puny in comparison with the grand agencies of elevation and subsidence which were at work in former times.

Third Meeting, December 13th, 1869.

SIR RODERICK I. MURCHISON, Bart., K.C.B., President, in the Chair.

Presentations.—*Theophilus Herrez, Esq.; B. C. Stephenson, Esq.; Rhodus T. Pritchard, Esq.*

Elections.—*Richard Vicars Boyle, Esq., M.I.C.E., &c.; George Frederick Browning, Esq.; Louis Blacker, Esq.; William H. Coleille, Esq.* (Surgeon H.M. Indian Army); *Douglas W. Freshfield, Esq.; Dr. Andrew Graham* (Staff-Surgeon R.N.); *Charles Horne, Esq.; Alexander Bennett M'Gregor, Esq.; T. G. A. Palmer, Esq.; James*

Reiss, Esq.; Joseph Marcus Rice, Esq., M.D.; James V. Shaw, Esq.; William Robert Ward, Esq.; James Shearer Wicheloe, Esq.

Accessions to the Library from November 22nd to December 13th, 1869.—'C. F. v. Martius. Ein Lebensbild.' Von Dr. H. Schramm. Lockhart's 'Medical Missionary in China, 1861.' Donor, the Rev. J. G. Wood. 'Sketches of North America and the Oregon Territory.' By Captain H. Warre. Donor, the author. 'The Water Supply of Jerusalem, Ancient and Modern.' By J. I. Whitty. Donor, the author. 'Journal of an Overland Journey from China to India —the Plains of Hopeh.' By T. J. Cooper. Calcutta, 1869. Donor, the author. 'Scenery of Scotland, in Connexion with its Physical Geology.' By A. Geikie. 1865. Purchased. 'Scenery of England and Wales, &c.' By D. Mackintosh. 1869. Purchased. 'Reise in das Gebiet des Weissen Nil in 1862-64.' Von M. Th. v. Heuglin. Leipsig, 1869. Donor, the author. 'The Antiquities of Cambodia' (Photograph Illustrations). 1867. By J. Thompson. Purchased. 'Travels in Mantchu Tartary.' By G. Fleming. 1863. Purchased. 'Yeddo and Pekin.' By R. Fortune. 1863. Purchased. 'Ancient Sea Margins.' By R. Chambers. 1848. Purchased. 'Dyaks of Borneo.' By F. Boyle. 1865. Purchased. 'Les Naufrages (Iles Auckland).' Par F. E. Raynal. Paris, 1870. Donor, the President. 'Rhone et Danube.' Par E. Des Jardins. Paris, 1870. Donor, the author.

Accessions to the Map-room since the last Meeting of November 22nd, 1869.—Map of the Suez Canal, &c. By A. K. Johnston. Presented by the author. Central America, Costarica. By A. Frantzius. A Map of the North and South Polar Regions, showing the Routes of Explorers. A Map of the Basin of the Nile, from Alexandria to Lake Albert Nyanza. By M. Heuglin. A Map of Turkey in Europe. All presented by A. Petermann, Esq.

The President opened the business of the meeting by the following remarks on the subject of a letter from Dr. Livingstone to Dr. Kirk, written at Ujiji, May 30, 1869, which had appeared in the newspapers of the morning:*—

* The following is a correct copy of this letter, as communicated to the Society by the India Office:—

From Dr. David Livingstone to John Kirk, Esq., Political Agent, Zanzibar.

Dated 30th May, 1869.

"This note goes by Musa Kamaala, who was employed by Koorji to drive the buffaloes hither, but by overdriving them unmercifully in the sun and tying them up to save trouble in herding, they all died before he got to Unyanyembe. He witnessed the plundering of my goods, and got a share of them, and I have given him beads and cloth sufficient to buy provisions for himself on the way back to Zanzibar. He has done nothing here. He neither went near the goods here, nor

"Much as I regret to find, by the letter which has been printed in the 'Times' of this day, that the intrepid traveller had recently to contend with difficulties owing to the misconduct of certain Arabs, it is for us geographers to admire still more the indomitable resolution with which he was preparing to conclude his labours. The very words preceding his last paragraphs express so entirely what I surmised would be my absent friend's final endeavour, whether I was addressing this Society or explaining my views to others, that I cannot forbear from quoting them. 'As to the work to be done by me (says Livingstone), it is only to connect the sources which I have discovered from 500 to 700 miles south of Speke's and Baker's with their Nile.'

"Let us, therefore, hope that this intended effort has ere now been crowned with success, and that no long period will elapse before we are rejoiced in welcoming him home. At the same time, we must be prepared for the possible contingency that the waters of the Lake Tanganyika should be found not to flow northwards into the Lake Albert Nyanza, but to be deflected to the west; and in that case, if Livingstone should be adequately supplied with carriers and provisions, he will, I doubt not, follow these waters, and thus, being led on perhaps to the Congo, we may once more be subjected to a long and anxious period of suspense."

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tried to prevent their being stolen on the way. I supposed that pay for four months in coming, other four of rest, and four in going back, would be ample; but I leave this to your decision. I could not employ him to carry my mail back, nor can I say anything to him, for he at once goes to the Ujijians and gives his own version of all he hears. He is untruthful and ill-conditioned, and would hand over the mail to any one who wished to destroy it. The people here, like the Kilwa traders, are haters of the English. Those Zanzibar men whom I met between this and Nyassa were gentlemen, and traded with honour. Here, as in the haunts of the Kilwa hordes, slaving is a series of forays, and they dread exposure by my letters; no one will take charge of them. I have got Thani bin Suellim to take a mail privately for transmission to Unyanyembe. It contains a cheque on Ritchie, Stewart, and Co., of Bombay, for 2000 rupees and some forty letters written during my slow recovery. I fear it may never reach you. A party was sent to the coast two months ago. One man volunteered to take a letter secretly; but his master warned them all not to do so, because I might write something he did not like. He went out with the party, and gave orders to the head-man to destroy any letter he might detect on the way. Thus, though I am good friends outwardly with them all, I can get no help in procuring carriers, and, as you will see if the mail comes to hand, I send to Zanzibar for fifteen good boatmen to act as carriers, if required, 80 pieces of merikano, 40 pieces of kimitra, 12 farasalas of the beads called jamaam, shoes, &c.; and I have written to Seyd Majid begging two of his guard to see to the safety of the goods here into Thani bin Suellim's hands or into those of Mahomed bin Saleh.

"As to the work to be done by me, it is only to connect the sources which I have discovered from 300 to 700 miles south of Speke and Baker's with their Nile. The volume of water which flows north from lat. 12° S. is so large, I suspect that I have been working at the sources of the Congo as well as those of the Nile. I have to go down the eastern line of drainage to Baker's turning-point. Tanganyika, Nyige Chowambe (Baker's?) are one water, and the head of it is 300 miles south of this. The western and central lines of drainage converge into an unvisited lake west or south-west of this. The outflow of this, whether to Congo or Nile, I have to ascertain. The people west of this, called Manyema, are cannibals, if Arabs speak truly. I may have to go there first, and down Tanganyika, if I come out unrated, and find my new squad from Zanzibar. I earnestly hope that you will do what you can to help me with the goods and men. 400*l.*, to be sent by Mr. Young, must surely have come to you through Fleming and Co.

"P.S. A long box, paid for to Ujiji, was left at Unyanyembe, and so with other boxes."

The Secretary read the following letter from Mr. G. W. Hayward :—

"MY DEAR SIR, "Murree, Punjab, September 11, 1869.

"I have the pleasure to forward to your address the accompanying maps and reports of Eastern Turkistan, from where I have lately arrived.

"The papers are far from being so complete as I could wish them, since of necessity they have been made out somewhat hurriedly, as opportunity offered at various times, for the most part during my stay at Yarkand and Kashgar.

"The accompanying map is on a scale of 16 miles to 1 inch, and a larger map on a scale of 8 miles to the inch is in course of construction.

"No attempt, as you will observe, has been made to fill in the details of country situated at any distance from the line of route which has not been personally explored and surveyed. The map has, therefore, a somewhat incomplete appearance, but at the risk of its being thought so, I wish to be able to maintain its general accuracy, in preference to filling in uncertain details of country, which might be found incorrect by future explorers.

"The instruments used during the exploration are those which were supplied to me by the Society. The mountain part of the work may be considered to be the most reliable, as here I was able to use instruments as I wished. After entering the plain country, however, I could not survey openly as before, for I need hardly say that amongst such a suspicious race as the inhabitants of Eastern Turkistan, the open and repeated use of scientific instruments would have been highly dangerous, if not fatal to the success of the enterprise. Here I depended greatly on observations for latitude, and the distances and bearings of the different points and places.

"All observations of the sun's meridian altitude at Yarkand and Kashgar, &c., have been recorded in a table accompanying this paper, with the view that the data furnished may be *accurately computed* for the latitude of these places. This is a subject of so much interest, that I may be excused if I request that no values of the positions of these cities be published until the data have been worked out by Captain George, or other competent person deputed by the Society's Secretary.

"The heights above sea-level have all been calculated from Casella's Tables for hypsometric measurement. They are subject to correction, for which purpose the boiling-point of water at the different places of observation has been given in a list attached to the Meteorological Observations sent herewith, to which is added a list of the towns and villages visited or noticed in Eastern Turkistan, the main routes from Ladak, &c., and a sketch plan of the forts of Yarkand and Kashgar.

"I would draw especial attention to the new trade-route discovered during my exploration of the Karakash River. This line of communication is from Chang Chenmo, *viâ* the upper valley of the Karakash and Aktagh, the valley of the Yarkand River, and across the Kuen Luen Range by the Yangi Pass, to Yarkand. The natural advantages are great, and the road perfectly practicable for laden horses and camels, and might be made so for two-wheeled carts and conveyances, as well as for the passage of guns.

"I must not fail to make favourable mention of the small artificial horizon, the invention of Captain George, supplied to me by the Society. I have found this little instrument to be invaluable. It has been objected to as being, perhaps, somewhat too small; but apart from the inconvenience of carrying an average sized apparatus amongst peaks and glaciers, it must be remembered that to carry an ordinary sized artificial horizon attached to the waist-belt without attracting attention is impossible, whereas this little instrument can be carried ready for use, and, in case of interruption when taking an observation, the cover

can at once be screwed on, and the instrument placed in the pocket or belt, which would be impracticable with an ordinary sized horizon.

"I must beg of you to be good enough to make my excuses to the Council of the Society for any delay in hearing from me ere this. Had I even had the opportunity of transmitting papers or news from Turkistan it would have been most impolitic to have made the attempt, for in the eyes of the natives correspondence is conspiracy.

"I have been much disappointed in not being able to effect my original intention of returning to India from Yarkand *viâ* the Pamir and Chitral. I found every effort to get away in that direction quite useless, and no alternative remained but to retrace my steps to Ladak, and essay some other route.

"I am now about starting to explore the Pamir Steppe and the sources of the Oxus, by the way of Gilgit and the head of the Chitral Valley; and if successful, I venture to hope that on return to England I may be enabled to add to the work already done, and complete a very fair map of this part of Central Asia.

"Although I can hardly expect the Council of the Society to fully appreciate the dangers and difficulties which a European must have to contend with when entering such countries, with the exception of those who may know perhaps from personal experience what the Central Asiatics are, yet I feel sure they will do me the justice to believe that I have undertaken this exploration with a thorough liking for the work in hand, and a determination to do my best; and though it must necessarily be many months ere they can hear of me again, they will rest satisfied that I am still endeavouring to do good work in so interesting a field as the *terra incognita* of Central Asia.

"GEORGE W. HAYWARD.

"To SIR RODERICK I. MURCHISON, BART., K.C.B.,
President of the Royal Geographical Society, London."

The following paper was then read:—

Journey from Leh to Yarkand and Kashgar, and Exploration of the Sources of the Yarkand River. By G. W. HAYWARD.

[EXTRACTS.]

I ARRIVED at Leh, the capital of Ladak, on the 21st of September, 1868, having left Murree in the Punjab on the 26th of August.

From Leh to Yarkand there are three routes open to the traveller to choose. The first is the Zamistânee, or winter route, which from Leh crosses the Digur Lá Pass, and ascends the valley of the Shayok River to near the Karakoram Range. The second, the Tabistânee, or summer route from Leh, crosses the Kardung Pass, 17,574 feet above the sea, and the Shayok River at Suttee; from whence, ascending the Nubra Valley, it crosses Karowal Pass, and then the difficult Pass of Sasser, 17,972 feet above the sea, joining the former route at Moorghoo.

The third route from Leh is *viâ* Chang Chenmo and the Chang Lang Pass, 18,839 feet above the sea; and crosses the series of high plains lying between Chang Chenmo and the Kuen Luen

Range, below which it enters the valley of the Karakash River, and conducting down that valley joins the Tabistânee route at Shadula.

The distance from Leh to Yarkand by the Zamistânee route is 530 miles, by the Tabistânee some 480 miles, while by the Chang Chenmo route it is 507 miles. Shadula being distant from Leh by this latter route 316 miles; from whence it is 191 miles to Yarkand.

The great desideratum to insure an increasing traffic with Central Asia, is the opening out of a shorter and easier trade-route, leading direct from the North-west Provinces of India to Yarkand. A good road, avoiding both Kashmir and Ladak, would offer greater facilities to the Yarkand traders for reaching India direct, and have the desired effect of insuring an easier transit, as well as doing away with the difficulties, both political and geographical, which attach to the old Karakoram route. The desirability of such an event was so evident, that the ascertaining if such a route existed was one of the main objects kept in view by the present expedition.

Intending to proceed by the Chang Chenmo route, we got off from Leh on the evening of the 29th September, and made a short march to Tihsee, a village situated in the valley of the Indus. At 20 miles from Leh the road leaves the Indus Valley, and turns to the north up a ravine, to the village of Sakti, where yaks can be obtained for crossing the Pass into Tanksee.

The descent on the north side is at first steep, and the road conducts down a ravine to Seeprah, a Bhoot encampment in the valley. Tanksee, 12 miles distant, is reached early the next day. This village, which is 49 miles from Leh, is the last place in the Maharaja of Kashmir's territory where any supplies can be obtained. With the exception of a few stone huts near Chang Chenmo, no habitation is met with, nor can any supplies be obtained until reaching Turkistan, 400 miles away. A delay of two days here was therefore unavoidable, in order to make the final arrangements for the long journey before us. Four Bhoots, or Ladak villagers were engaged to accompany me to the borders of Turkistan, and their yaks laden with grain for the horses.

Chang Chenmo is a district lying about 50 miles north-east from Tanksee, from which it is reached in three or four days' journey.

Chang Thang, with Rudok, lie more to the eastward. The greater part of the Chang Thang district contains salt-mines, from which the whole of Ladak and part of Tibet are supplied with salt, while a large traffic is also carried on with Kashmir. The salt is brought down from the mountains on sheep, which are extensively used

throughout Ladak and Tibet for carrying light loads. I met a flock of several hundreds coming down the Chang Lá Pass, and laden with salt, placed in small bags across the back, the average weight which one sheep will carry being about 30 lbs. The wool of these sheep is considered to be excellent, and is in great demand at Leh for transportation to Kashmir, besides which the valuable wool of the shawl-goat, abounding in Chang Thang, is the main article of traffic sent to Kashmir.

Leaving Tanksee on the 5th October, we proceeded towards Chang Chenmo, marching that day to Lukong, a place consisting of a few stone huts, situated at the end of the Pangong Lake.

Already, thus early, we had warnings of the inclemency to be expected from the lateness of the season, for a snow-storm came on towards evening, during which we wandered from the track, and, not at once regaining it, did not reach Lukong until late at night. Between here and Chang Chenmo, another high pass, the Masimick, has to be crossed. It is nearly 18,500 feet above the sea, and is generally covered with snow.

Crossing the pass, we encamped that night at Rimdee, 2 miles below, at an elevation of 17,200 feet. The cold was severe, the thermometer, at 7 A.M. the next day, marking 3½° Fahr.

Having marched from Pumsul, we ascended the Kugrang Valley with the intention of crossing the range at its head and following the stream rising there, which is represented on our maps as the Yarkand River, down to Aktágh. The pass at the head of the valley was found to be a very practicable one; but no feasible route into the valley of the supposed Yarkand River was discernible. We therefore returned down the Kugrang Valley, losing a horse from cold and inflammation on the way, and camped at Gogra for a few days previous to going on up the Chang Lang Valley on our way to Turkistan. More supplies were got up from Tanksee and farewell letters written to England, as all communication between civilisation and the wilds of Central Asia was about to be severed.

We left Gogra on the 25th of October, making a march to some hot springs in the Chang Lang Valley. These springs are at an elevation of more than 16,000 feet above sea-level, and gush out from orifices in the summits of these rocks situated in the bed of the stream which flows through the valley. The whole ground is white with incrusted saltpetre, while a fantastic pile of earth indicates the position of an old spring, now extinct.

From hot springs to the Chang Lang Pass the road is up the bed of the stream, which, frozen over, had to be crossed several times. The ascent to the pass lies up a ravine filled with loose stones and

débris, and is very gradual and easy to within 500 feet of the summit. This pass, which is at an elevation of 18,839 feet above the sea, is generally known as the Chang Chenmo one, and is said to be the easiest of all the passes leading across the Karakoram and Hindu Kush ranges. It is quite practicable for laden horses and camels, and would offer no great impediment to the passage of artillery; indeed, the ground is so favourable that a little labour expended on the construction of a road up the Chang Chenmo Valley to the pass would render it practicable for two-wheeled carts and conveyances. Geographically the pass is remarkable as being across the main range of the Karakoram, forming the watershed between the Indus and the Turkistan rivers, and constituting the natural boundary of the Maharaja of Kashmir's dominions to the north.

The road from the pass is level and good down the open valley between the low hills to Nischu, where we camped without finding grass or fuel, or even water, so late in the year. The cold was intense, the thermometer at 7 A.M. marking 11° below zero. I found it most difficult to keep anything liquid without being lost. Everything froze at once and burst the bottles. Trying to paint in water-colours was out of the question. Water, brushes, and colours all froze together, and the enamel on the tin paint-boxes cracked from the intense cold. The country beyond the pass until the Lingzi Thung Plains are reached consists of low hills and broken ridges of sand and clay formation. It is evidently covered with snow during the winter, since the surface of the ground shows signs of the action of running water from the melting of the snows.

Some 16 miles from the pass is the descent to the Lingzi Thung Plains, which are nearly 17,000 feet above sea-level, and extend for 40 to 50 miles from north-west to south-east. Their breadth is some 25 miles, being bounded on the south by the Karakoram chain, and on the north by a somewhat irregular and lower range, called the Lak Tsung Mountains. They are covered with snow during the winter, and in the summer many lakes and pools of water must be formed by its melting. At this time of year, however, not a drop of water was to be found, all the pools having dried up or infiltrated into the sand.

The wind blowing across these elevated plains was intensely cold; and directly after leaving the low hills the full force of it was felt. My servants complained most bitterly, and seemed to be quite incapable of doing anything. The weather was generally fine, with a clear sky, during the months of October and November, but the wind, which came on to blow daily from noon until sunset,

was most intensely cold. The only way to cross these inhospitable regions in any comfort is to bring wood and water from the Chang Lang Valley; and this we failed to do, as the Bhoots, with the usual obtuseness of Ladak villagers, never mentioned the total absence of these requisites until after we had crossed the pass.

Beyond the Lak Tsung Mountains is a second series of plains with low ranges running through them, extending up to the spurs of the Kuen Luen range. They are similar to the Lingzi Thung, but some 1000 feet lower. Late in the evening of the day we entered them we arrived at Thaldat, where is a frozen lake and spring. The water here was very brackish, but the animals drank it eagerly, being the first they had had for four days. There was no grass, however, at Thaldat, but the day we left the place some was discovered in a ravine lying west of it, about a mile away.

As I had failed to find a pass from the head of the Kugrang Valley into the valley supposed to contain the head source of the Yarkand River, I determined to attempt a route across the mountains from Thaldat, though, from the probable absence of grass and water, it was a somewhat hazardous undertaking for our animals so late in the year. At some 50 to 60 miles' distance direct north, I knew we should strike the valley of the Karakash River below the Kuen Luen range, and the route which I intended to explore might lead us anywhere. When I gave orders to strike the camp and prepare to march, the Bhoots and my own servants were anything but pleased at going off to explore a new route. I had this morning ascended the ridge lying west of Thaldat and obtained a good view of the country around. Looking north was seen the lower range of the Kuen Luen with its highest peaks glistening in the morning sunlight, while eastward stretched the wide expanse of desert known as the Aksai Chin. In many places the appearance of a mirage indicated the position of a former lake, the water of which had now evaporated, leaving an extensive saline incrustation, while a large lake was distinctly visible to the south-east. Beyond this again some high snowy peaks occurred, but whether situated in the main chain of the Kuen Luen or in a secondary spur of that range could not be determined with accuracy. The impression at the time favoured the supposition that the main chain of the Kuen Luen terminates as such somewhat abruptly to the eastward, and at about the 82° meridian radiates in lower spurs running down into the high table-land of the Aksai Chin, or White Desert.

A high range, in which are peaks of upwards of 20,000 feet above sea-level, bounded the view at the distance of 80 miles to the south-

east. This range, either the continuation of the main Karakoram chain or a spur from it, was visible, stretching from the head of Chang Chenmo, and trending with a direction of E.N.E. towards the spurs of the Kuen Luen to the eastward.

Looking to the west, it was evident that a journey of 25 to 30 miles in that direction would strike the head-waters of the supposed Yarkand River, if an easy pass could be found across the range forming its east watershed. A valley running westward appeared to offer the best route, and, getting into this, we went up to its head, and crossing a low ridge descended into a wide sandy valley flanked by irregular detached ridges. We encamped here for two days in order to give the animals a rest, as, fortunately, there was a little grass and fuel obtainable, and I went off alone to explore the country ahead. The features of the mountains about here are irregular and broken ranges of red clay and sand formation, while the valleys and ravines are filled with sand and conglomerate. No water was to be seen in any of the valleys or ravines, excepting in one or two places where a deeper depression in the valley had accumulated a little water which was now one mass of ice. It was gratifying to find a very easy pass across the range, beyond which should be the valley of the Yarkand River; and all the animals were safely got over across the watershed into a branch valley late on the evening of the 4th of November.

The pass was found to be 17,859 feet above the sea by the temperature of boiling water, and is a mere ascent of a few hundred feet from the valley below, with an equally easy descent on the north side. It is hardly worthy the name of a pass in the general acceptation of the term; still no less is it across a watershed into the head of one of the Turkistan rivers. I then discovered that the direct road to come from Chang Chenmo to this pass would have been direct from the Chang Lang Pass, skirting the Lingzi Thung Plains, and that a valley across from there direct was shorter and easier than the one which we had followed from Thaldat.

At 10 miles below the Kizil Pass we struck the junction of a large valley coming in from the south-west, in latitude 35° 16′ 25″ N., and camped here, calling the place Kizil-jilga. This was evidently the upper waters of the Karakash River, now nearly frozen over. At the time I imagined this stream to be the main branch of the Yarkand River, which it should have been were our present maps correct, but eventually by following this river down to Shadula, it proved to be the real Karakash, which, instead of rising in the Kuen Luen Mountains, has its source where the Yarkand River is represented as rising, in the valley lying west of the range border-

ing the Lingzi Thang Plains in that direction, which range forms its east watershed.

The next day we made a long march down the main valley, which runs north-west, and is wide and open, and the road excellent. Again the wind came on to blow, and surveying was certainly accomplished under difficulties. When on some high ridge of mountain, after taking the bearings of the different peaks around, it was often difficult enough to write down the observations legibly in one's field-book. Notwithstanding the extreme inclemency of the weather, I enjoyed the exploration thoroughly, for all this country was totally unexplored; and it was interesting in the extreme, since at the time I did not know what river it was that we were following; and, furthermore, the road was so good and quite practicable for laden horses and camels that it was probable I was then traversing what in future would become the main trade-route between India and Eastern Turkistan.

Six miles beyond the hot springs the river suddenly turns to the north-east, and from this bend resembled a frozen lake for 3 miles, of about half-a-mile in width. The journey was here over the ice, since the steeper sides of the mountains and the rocky ground rendered a road along the bank more difficult than one over the frozen river.

The river diverging at this point to the north-east was at first unaccountable, since, if it were the Yarkand River, its course from here should have been north-west; yet it was soon evident that this could not be the Yarkand River, but the real Karakash. It was now optional to follow the river along its downward course, or attempt a route across the Karatâgh range into the basin of the Yarkand River to the westward, and join the regular road from across the Karakoram Pass at Aktâgh.

The latter course would be desirable, as proving the feasibility of a trade-route in that direction or otherwise; while the former offered the greater inducement of exploring the course of the Karakash down to Shadula. It seemed certain that a road conducting up the ravine, joining the main valley at this bend, or one ascending the wide valley noticed just above the hot springs, would lead across the range bounding the Karakash here on the north, and named the Karatâgh, and join the Karakoram route near Aktâgh, which place lay at a distance of 36 to 40 miles in a direct line from this point. Judging from the configuration of the country, the pass across the Karatâgh would probably be found to be a very easy one, and assuredly not more difficult than the famed Karakoram Pass, which, notwithstanding its notoriety, is a very easy

one, although at the high elevation of 18,317 feet above the sea. The interest attaching to the course of the Karakash, however, prevailed, and I determined to follow the river downwards to Shadula.

Some 12 miles below Mulgoon the river suddenly turns to the north-west, and runs through the valley of Sarikee to Shadula. The name Sarikee is applied to the valley of the Karakash from here downwards, which is evidently the Sareka of Moorcroft and the Chinese itineraries.

We were now under the Kuen Luen range, some high peaks in which rose immediately to the north-east; and coming in at this bend is a valley from the south-east, down which the road from Thaldat conducts, which route we should have followed had we not diverged from there. I had now proved the river we had been following to be the real Karakash, and thus to have its rise not in the Kuen Luen range, but in the main chain of the Karakoram. The valley effecting a junction here from the south-east has hitherto been represented as containing the main branch of the river; and the error has apparently arisen from Mr. Johnson not having seen the point of junction of the real stream when he crossed this valley on his way to Khotan in 1865. Mr. Johnson, it is known, went into the valley of the upper Karakash, but never so far down the river as to be able to see its upper course for any distance. Had he done so, any observations for altitudes would have shown that this could not be the same stream as that which passes Aktágh, on account of the difference in the elevations of the several places Any one not following the river downwards would probably make a similar mistake; for the configuration of the country, as seen from a distance, would lead one to suppose that the river continued the general direction of its upper course in the same line as far as Aktágh.

From this point the Karakash runs, with a general course bearing w.s.w. to Shadula, some 75 miles distant; and skirting the southern base of the Kuen Luen, which rises in a high rugged range to the north, some of the higher peaks attaining to an altitude of 21,000 and 22,000 feet above the sea.

We reached Shadula on the 20th November, and found the fort occupied by a Panja-bashi (sub-officer) and some dozen soldiers of the Yarkand ruler.

As I had come openly as an Englishman, the news that I was on my way to Yarkand had reached there many days before; and the time that had elapsed in following the Karakash River down to Shadula had given the guard ample opportunity of making arrangements to allow me to proceed or stop me here, according to their orders.

Arrived at Shadula, I found that Mr. Shaw, who had travelled up from Kangra with a large caravan of tea and other goods, had reached here by the direct Chang Chenmo route a few days earlier. The guard would not allow us to communicate in any way, and it was at once evident that they were immensely suspicious at the almost simultaneous arrival of two Englishmen. Unfortunately, Mr. Shaw and myself had been in ignorance of each other's intentions and movements, and were, therefore, unable to combine our plans and act in concert. After some conversation with the Panjabashi by means of an interpreter, I began to perceive how matters stood, which may be thus explained. A Moghul at Yarkand, who had lately arrived from Ladak, had spread there a report that fifty Englishmen were coming, and that he had seen them himself! Consequently, the greatest amount of suspicion prevailed in Yarkand, whence messengers were daily despatched to the King, at his camp beyond Kashgar, where, it was reported, he was holding the Russians in check on the northern frontier of Turkistan. Some Punjabi merchants arriving a few days later had greatly relieved the fears of the suspicious Yarkandies, by assuring them that the report about fifty Englishmen coming was entirely false; and the Moghul who had caused the alarm was at once imprisoned and would probably be executed.

Still their distrust, so easily aroused, was not to be at once allayed, and an extra guard was immediately despatched to Shadula with strict orders to stop any one there coming from Ladak. On my expressing a wish to the Panja-bashi to have a letter sent off to the King, asking permission to proceed, he ordered a mounted sipahi to be in readiness; but as none of the men could write, and of course English was unknown in Turkistan, a difficulty presented itself. This was at length got over and arranged by my writing a letter in English to the King, and giving to my interpreter to take, accompanied by the sipahi. A horse was also provided for my man, who had strict instructions as to what he had to say: that I had travelled a distance of 8000 miles, occupying six months; and now, having arrived on the borders of Turkistan, sent forward, asking permission to enter his country and have the honour of an interview.

An answer to my application could not be expected to arrive within twenty days; and during the next few days I considered what other plans lay open to me to endeavour to carry out, should permission to enter Turkistan be refused. To return to Ladak across the mountains in December would be sufficiently unpleasant; but as the Zojji La Pass into Kashmir would be closed by the snow,

there would remain the only alternative of wintering in Ladak, and in the spring endeavouring to penetrate to Turkistan and the Pamir Steppe by some other route. The idea of passing a winter in Ladak doing nothing was not to be entertained, and to be turned back now, after having travelled 800 miles from our own frontier, would be most unpleasant.

Having discovered the source of the Karakash to be where all our maps make the head-waters of the larger river—the Yarkand one—to have their rise, it was most desirable to ascertain the real course of the Yarkand River, as being the chief river of Eastern Turkistan. I was, therefore, most anxious to undertake this expedition, knowing the time could not be better employed while awaiting the return of my messenger from Yarkand. The difficulty in accomplishing it lay in the close *surveillance* of the guard of Turki sipahis, which rendered any attempt at getting away on an exploring expedition unlikely to be successful; and if the sipahis suspected my object, they would be sure to accompany me, in which event using surveying instruments openly would be out of the question, and any exploration further than two or three days' journey also impossible. There was a chance that I might be able to get away for the day for the purpose of shooting without being accompanied, and this seemed to be the only way of shaking off the guard. The men with me at this time, besides my own servants, were the Bhoots who had accompanied me from Ladak. They were awaiting my interpreter's return from Yarkand, when, if I was allowed to proceed, they would be dismissed to their homes, or else accompany me back to Ladak, should I have to return. They regarded the Turki sipahis in no very friendly light, and were, therefore, not likely to disclose my plans, which were carried out successfully.

Leaving my own servants in charge of camp, and taking three of the Bhoots with a week's supply of provisions, we started from Shadula at the first streak of daylight on the morning of the 26th November, without the guard being aware of our departure. Marching up the valley leading to the Kirghiz Pass, beyond which lies the valley of the Yarkand River, we encamped that night at Kulshishkun, a famous place for wild yak, but this day found without any large game upon it. From Shadula the road runs up the right side of the stream, and is gradually on the ascent to Kulshishkun, which is 13,965 feet above sea-level, or some 1800 feet higher than Shadula, from which it is 15 miles distant. To the north of the valley, the western Kuen Luen range rises into lofty peaks; while to the south it is bounded by a long spur from

the Aktágh range, across which lies the Sooget Valley. In order the better to distinguish the geographical features of the great Kuen Luen chain of mountains, it has been divided into eastern and western ranges from where the Karakash River pierces the chain on the meridian of Shadula. Any remarks on the Kuen Luen, therefore, will be understood to apply to that division of the range as it bears relatively eastward or westward from Shadula.

The road continues over the more even ground on this side the valley, and skirts the long spurs of the Aktágh Range on the left, after it has crossed the stream. Approaching the pass the valley bifurcates, the northern branch containing the main source of the stream which rises under a large glacier lodged at the head of the ravine, between two high snowy peaks in the Western Kuen Luen. The Kirghiz Pass, 17,093 feet above the sea, lies at the head of the western ravine, up which the road winds with a gentle ascent to the summit. The pass commands an extensive view of the country far and near, and I was able to fix the bearings of some of the highest peaks in the Eastern Kuen Luen, lying 90 miles away, which had already been mapped in, and thus ascertain the value of my survey up to this point, as these peaks are visible from the southward on entering the Lingzi Thung Plains, at a distance of upwards of 100 miles.

The Karakoram and Muztágh mountains, with the range of the Western Kuen Luen, were in sight to the westward, and one was at once struck with the very wild and rugged scenery in this direction. Amongst the interminable mass of precipitous ridges, deep defiles, and rocky ravines, it was difficult to distinguish the exact course of the Yarkand River; but its general direction could be easily determined as flowing through the long longitudinal valley between the two main ranges. Not a tree, bush, or shrub met the eye anywhere; it was solely a magnificent panorama of snowy peaks and glaciers, as the last rays of the setting sun tinged their loftiest summits with a ray of golden light.

It was dusk as we commenced the descent down the lateral ravine leading from the pass. The road, a mere track, winds down the steep side of the ridge to the head of the ravine, the bed of which is blocked up with *débris* and rocky boulders, while the stream in it was entirely frozen over. We were now in the basin of the Yarkand River, since the Kirghiz Pass leads across a depression in the Aktágh Range, immediately below its point of junction with the main chain of the Kuen Luen. Marching up to nine o'clock by moonlight, we got down to near the valley of the Yarkand River. The spot chosen for our camp for the night lay in the gorge of a lateral defile, where

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running water was found, while a few stunted bushes which fringed the stream were soon appropriated and kindled into a cheerful blaze. We had descended nearly 3000 feet from the summit of the Kirghiz Pass, since our camp lay at an elevation of 14,225 feet above sea-level. Starting early the next morning, we continued down the narrow ravine to its junction with the valley of the Yarkand River, which was struck at a distance of 33 miles west of Shadula. An observation obtained one mile lower down the valley showed the latitude to be 36° 22′ 7″ N. The river here comes down from the south, winding between precipitous spurs of the Karakoram and Aktâgh ranges, the valley being here much confined, and varying from 300 to 500 yards in width.

Below Kirghiz Janjal, where the elevation of the valley is 13,684 feet above the sea, the river turns to the westward, and continues with a general course in this direction towards Sarikol. The valley, from here downwards, is full of low jungle, grass, and herbage, which become more profuse as the elevation decreases, while saltpetre and rock-salt occur in many places. Deep long ravines between the high spurs, running down from the Karakoram chain, come in from the south, while the shorter valleys of the Western Kuen Luen, to the north, narrow as they reach the crest of the range, and are closed in by rocky heights and glaciers.

At 14 miles below Kirghiz Janjal is a camping-ground, called Koolumooldee, where the road leaves the valley of the river and ascends a confined, somewhat difficult, defile, leading to the Yangi Pass. It is practicable for laden horses and camels throughout, and there can be no doubt that this is by far the easiest and most direct route from across the Karakoram into Eastern Turkistan. Kugiar is reached in five days' journey from Koolumooldee, and Yarkand in from seven to eight days. East of the Yangi Pass, on the northern slope of the Western Kuen Luen, rises the Tiznâf River, which joins the Yarkand River to the east of where it is crossed on the road between Karghalik and Posgâm, and is one of its principal tributaries. The Yangi Pass leads across a remarkable depression in the Western Kuen Luen Range, and is about 16,500 feet above sea-level in elevation.

I did not reach the summit of the pass, since it was out of my line of exploration: but, when returning up the river, I ascended the Western Kuen Luen, and attaining to a station on the range at an elevation of nearly 19,000 feet above the sea, commanded a full view of the pass below me. A long spur running down from near the pass bounds the ravine, up which lies the road, to the westward, the prevailing features of this ridge being red earth, sand, and shingle.

The west side of the ravine itself rises in successive terraces and platforms of conglomerate, one above the other, presenting a steep scarp to the eastward.

Continuing down the main valley we left Koolumooldee behind us, and walking up to dusk, reached to near where the Muztágh Pass stream joins the river. The Yarkand River from here bears somewhat more to the south, and skirts the precipitous and rocky spurs running down into the valley from a group of high snowy peaks in the Western Kuen Luen. The highest peak in this group was found to attain to an elevation of 22,374 feet above sea-level. It may here be mentioned that the heights of inaccessible peaks were calculated from the angles of altitude found with sextant and artificial horizon at two stations fixed by triangulation, the peak also being fixed by triangulation, and the heights of the stations known from observations of the temperature of boiling water. They have no pretension to being very accurate, but are fairly approximate, and may be considered to be within 300 or 400 feet of true altitude.

Arriving at dusk at the junction of a large stream coming in from the south, we prepared to halt for an hour. This stream, of considerable size, is one of the largest of the upper branches of the river flowing from the northern slope of the Karakoram Range. Its banks are very precipitous, and the continued action of the water on the beds of pebbly conglomerate which fill the exit of the valley has abraded their sides, until a series of caverns have been formed extending far under the bank. Immediately beyond the mouth of this valley we came upon the fresh tracks of camels and horses, which indicated Kugiar men being about, or perhaps Kunjooties. It was necessary, therefore, to proceed with caution, since if seen down here by even the harmless Kugiares, the report would spread like wildfire that another Englishman had turned up in these valleys, and cause the suspicious Yarkandies to believe that the original rumour of fifty Englishmen coming from Ladak was, after all, correct, and, if Kunjooti robbers, to be carried off by them and sold into slavery would most effectually put a stop to further exploration. Halting beyond this we lighted a fire, taking care to choose a favourable spot, from where it could not be seen by any one, if about; and as soon as a full moon rose above the mountains, and was shedding her silvery light far down the valley, we went on again down the left bank of the river for about nine miles, until stopped at a place where the stream runs deep and strong, under a high bank to the left of the valley. We wasted an hour trying to invent something on which to cross; but the long poles cut from the jungle close by, with which we endeavoured to form a temporary bridge, were washed away at

once. Going back for a mile, we climbed the steep slope of the hill above the river, consisting of loose sand and shingle—the ground that gives way and lets one down about as fast as one progresses upwards. At length, descending again to the bank immediately above the river, we were arrested again a short distance further down, where a stream comes in from the south. This stream has carried into the main valley immense quantities of earth and *débris*, and now flows down out of sight between precipitous and over-topping banks, as if split by an earthquake. Steep heights enclose the valley on either hand, while above, to the north, rise the lofty snow-capped group of peaks in the Western Kuen Luen. The valley, some 2000 yards in width, was here found by observation of the temperature of boiling water to be 12,130 feet above sea-level. This was the furthest point down the Yarkand River which was reached. There was every probability that the guard of Turki sipahis would follow us from Shadula, and arriving at the junction of the Kirghiz Pass valley before we could return, thus cut me off from going up the river to its source; consequently, I determined to march back up the valley during the night. Retracing our steps, we reached the spot where we had lighted a fire the evening before, and as soon as day broke started back again up the valley. Crossing to the north side, I left the men with me at the foot of the mountain, and commenced the ascent of a steep spur of the Kuen Luen. It was evident that a station on this range would command an extensive view, and what appeared to be the most accessible point was fixed upon for the attempt. The steep slope of the mountain, covered with loose shingle and sand, was most unfavourable for climbing, and very different from the Kashmir mountains, which, although steep, afford firm footing on the grass and rocks. When the crest of the ridge, however, was gained, the difficulty decreased, and though the higher slope was steeper, the ascent was more rapidly and easily accomplished. After five hours' hard climbing, I reached the summit of the mountain in time to fix the latitude of the range by the sun's meridian altitude.

The magnificent view which this station commanded was an ample reward for the toil of the ascent. Far away to the south and south-west stretched the high peaks and glaciers of the Karakoram and Muztágh Range, some of whose loftiest summits attain to the height of from 25,000 to 28,000 feet above the sea. One peak, situated to the east of the Muztágh Pass, reaches the stupendous elevation of 28,278 feet above sea-level, and is one of the highest mountains in the world. Beyond where the river sweeps out west the snowy peaks above the Kunjoot country were in sight towards Sarikol.

East and west extended the whole chain of the Kuen Luen and the Kilian mountains, the last range to be crossed before the steppes and plains of Turkistan are reached, while immediately below lay the confined ravine up which the road ascends to the Yangi Pass, now full in sight beneath me. The extent of view of the main Karakoram or Muztâgh chain comprised a length of 200 miles, stretching from near the Karakoram Pass to the head of the Tashkurgân territory north of Hunza and Nagar.

The valleys that traverse the mountains between the crest of the chain and the longitudinal valley of the Yarkand River appear to narrow into ravines towards the head of the range, and are filled with glaciers; and the whole surface of the ground, to the north of the chain, is probably more elevated in its average altitude than the mountain system embracing the southern slopes of the range in the watershed of the Indus.

The cold at this elevated station, nearly 19,000 feet above the sea, so late in the year, was very severe, the thermometer sinking to 5° Fahr. in the shade, notwithstanding it was mid-day and a bright sun was shining. I had reached many higher altitudes, but never any commanding so extensive a view of such a stupendous mass of mountains; and it was with a feeling of regret that one turned to leave a spot from which the peaks and glaciers could be so well seen, stretching far away on every side in their solemn grandeur.

Descending into the ravine beneath, I went on down its rocky bed, and at four miles below again struck the valley of the Yarkand River, and being joined by the men who had awaited my return, ascended the valley to our camp near Kirghiz Janjal, from where we had started the morning of the day before, having walked incessantly since that time a distance of more than 35 miles.

On the next day, the 1st December, we went 16 miles up the river, thus getting above the junction of the Kirghiz Pass valley, and found that no sipahis had as yet followed us from Shadula. I sent off one of the men by this route to Shadula, with orders to my servants there to send provisions for us to a camping-ground called Aktâgh, some 50 miles further up the river, as the supply with which we had originally started was nearly consumed. This place, Aktâgh, is the third stage from the Karakoram Pass, on the Turkistan side, where the Shadula route separates, and the Kugiar or Zamistânee one conducts down to Kufelong, and thence down the valley of the Yarkand River. We were now on this road, and never doubted but that we should reach Aktâgh in three or four days at the latest. Keeping on up the valley we encamped that night at an elevation of 13,882 feet above sea-level. From here, ascending the

river, the road is up the right bank skirting the steep spurs of the Aktâgh range. It then crosses to the left bank and goes over the spur of a hill round which the river winds. Continuing up the left bank, the road is good, the valley again widens, and the slopes of the mountains are more gentle and less precipitous. Keeping on up the valley, and mapping the whole way, on the morning of the 4th December, we arrived at Kufelong, where the Karakoram Pass stream, passing Aktâgh, joins the main river. At this place, Kufelong, which is in lat. 36° 4' 48" N., long. 77° 57' E., and the valley here 14,340 feet above sea-level, the main river comes down from the south-west, and the Karakoram Pass stream, much smaller, and now entirely frozen over, joins from the south-east. The latter stream is represented on some of our maps as the head of the Tiznâf River, and on others as the Yarkand River, whereas the real main stream of the Yarkand River is not down on the map at all. From Kufelong I followed the main stream up to its source, but, at the time, was not aware that Aktâgh lay up the valley to the south-east, on account of the error on the map, imagining it to be on the main stream as represented.

Thirty miles ahead, up the main valley, the snow-covered spurs of the Karakorum were in sight, and the foot of these was reached on the evening of the day after we had left Kufelong. On the evening of our second day's journey from Kufelong we encamped in a wide part of the valley opposite to the entrance of a deep narrow ravine, effecting a junction from the south-west. At the head of this ravine a pass leads across the Karakorum Range into the Nubra Valley, in Ladak, and to Chorbut, in Baltistan.

The main valley here turns, and the river comes down from the south-east. Skirting these high ranges, our road lay up the open valley, through the wildest and most desolate country, where nothing but snowy peaks and glaciers, and the barren slopes of the mountains, met the eye. Not a blade of grass was to be seen; and it was with difficulty sufficient "boorsee" could be collected wherewith to light a fire. The valley again turns to the south; and we were now evidently near the source of the river, since it was rapidly decreasing in size and nearly entirely frozen over as we ascended.

On the afternoon of the 8th December, I reached the source of the Yarkand River. This is in an elevated plateau, or basin, surrounded by high snowy peaks, with the ravines at their base filled with glaciers. The centre of this plateau forms a depression of about 2½ by 1½ miles in area, which must contain a lake when the snows melt and drain into the basin, in which the little water now accumulated was a solid mass of ice. The outlet is to the west, in which

direction the stream, issuing from the basin, runs through a narrow ravine for 2 miles to the head of the open valley, where, joined by two other streams from the high range lying west, they form the head-waters of the Yarkand River, commencing here and flowing with a course of nearly 1300 miles into the great Gobi desert of Central Asia. I found the source of the river to be in lat. 35° 37′ 34″ N., and, by its distance and bearing from the Karakoram Pass, to be in long. 77° 50′ E., while the mean of three observations of the temperature of boiling water gave an elevation of 15,656 feet above the sea.

The cold in this inclement region, in the depth of winter, was most intense, the thermometer, at 8 o'clock the following morning, showed the mercury to have sunk to a level with the bulb, or some 18° below zero.

By exploring the country eastward, I ascertained that I had reached to near the summit of the main range of the Karakoram, and west of the Karakoram Pass.

After exploring the country at the head of the Yarkand River, it only remained for us to make the best of our way back to Kufelong; and, as Aktâgh lay up the branch valley joining there, we had thus missed the man sent off to Shadula to bring supplies for us. The only yak with us had succumbed from hard work and the want of grass half-way up the valley, and the Bhoots had killed him for food, as we were quite out of provisions. The weather had been threatening snow for the last few days, and an immediate return was imperative. Already heavy clouds were banking up amongst the high peaks of the Karakoram, obscuring their summits, while the sun set angrily and threw a lurid light through the higher masses of thick clouds, as we returned to camp on the evening of the 9th December. It commenced snowing as we started at dusk and retraced our steps down the valley, marching up to midnight through the falling snow.

On the evening of the 10th December we reached Kufelong again. On the following morning we started for Aktâgh and Shadula.

Coming into Aktâgh we met two of the Turki sipahis who had been sent out to search for us from Shadula. From what I could understand, I gathered from them that permission for me to proceed to Yarkand had arrived, and that no slight disturbance had been caused by my sudden disappearance; that the Panja-bashi, in despair, had sent out all the sipahis to search for us in different directions, who had never reached to within 50 miles of where we were, being themselves obliged to return after consuming the little provisions they were able to carry.

Fording the Karakash River twice, Shadula was soon in sight—a dreary and desolate place at any time, but it appeared almost charming just then.

As I rode up to the fort the Panja-bashi and sipahis were waiting to receive me, and seemed to be in utter astonishment at my sudden re-appearance. They had quite concluded that we were lost amongst the mountains, or had gone back to Ladak, for the sipahi who had come on in the morning had fortunately arrived just in time to prevent their starting without me for Yarkand. They had everything ready for the march, horses and yaks even loaded, when he came in, so thoroughly convinced were they that we should never return; and in dreadful fear lest the King should visit on them his displeasure for their remissness in allowing me to get away on an exploring expedition unaccompanied. They were delighted, therefore, at my re-appearance; and equally pleased was I at the prospect of seeing Turkistan, although the fact could not be ignored that hitherto it had proved to be to others "the country from whose bourne no traveller returns."

We had been absent from Shadula just 20 days, and during that time had traversed more than 300 miles of mountainous country.

The result of the expedition was very satisfactory, from having determined the geographical features and relative bearing of the Karakoram and Kuen Luen chains of mountains, as well as the true course of the Yarkand River.

We immediately prepared to start for Yarkand. As we rode away from Shadula every one was in high spirits at the prospect of leaving these inclement mountains, the sipahis testifying their joy by firing at a mark as they passed it at a gallop. I had given a pistol to the Panja-bashi, and we each followed with five barrels from a revolver. It was amusing to witness the delight and wonder of the Turkies at inspecting a revolver. They could not understand how a small weapon could shoot so many times in rapid succession; and they were never tired of looking at European firearms and expressing their desire to possess such weapons.

Our road from Shadula lay down the left bank of the Karakash River, which here runs with a northerly course piercing the main chain of the Kuen Luen. The mountains on either side the valley are consequently very high and precipitous, and many glaciers and moraines occur at the heads of the steep ravines.

Leaving the valley of the Karakash River, we proceeded up the narrow ravine leading to the Sanjú Pass, the stream in which was quite frozen over, while our journey lay between rocky precipices,

towering above the narrow defile. As no wood for fuel is obtainable near the pass, it was necessary to load one of the yaks with wood gathered in the lower part of the valley; and grass for our horses was also carried by the Kirghiz who accompanied us. We encamped that night at 2 miles below the pass, at an elevation of 14,474 feet above the sea. The last part of the way was over some difficult ground, where the ravine is much contracted, and the road over the frozen surface of the stream. Our camp for the night was formed under some over-hanging rocks in the defile well sheltered from the wind; and the Panja-bashi at once commenced dispensing Turki hospitality, by spreading out a "dastarkhan" of bread, dried fruit, and cakes, as we sat by a blazing fire. Already the Turkies had impressed me with a favourable opinion of their good intentions towards their visitor: and from their frank and courteous, yet independent, bearing, I was inclined to regard them in a most friendly light. We went on again up the pass at daylight, the last part of the ascent being very steep and over rocky ground, but the yaks we were riding carried us well right up to the summit, which is 16,612 feet above the sea. From the summit of this, the last pass into Eastern Turkistan, the country on the north side lies far below. Looking back are seen the sunny peaks of the Kuen Luen, beyond the Karakash River, and the Sooget Hills beyond Shadula. I was disappointed in my expectations of being able to see the plains of Turkistan in the distance, since a haze overhung the lower country, and light clouds, drifting over the intervening mountains, obscured the view. Down the north side of the pass the descent is very steep, and many accidents occur from horses slipping on the ice, which lies during winter on this side the summit.

When the merchants cross this pass with their caravans, they are obliged to obtain yaks from the Kirghiz to carry their goods over; and thus often experience serious delay in procuring them at once. The Kilian Pass is quite as, if not more difficult, while the Kullik Pass is even more so. They are all simply impracticable for laden horses and camels, and for any animals except yaks; and there can be no doubt that the true road into Eastern Turkistan is that conducting down the valley of the Yarkand River, and across the Yangi Pass to Kugiar, Karghalik, and Yarkand.

Mounting the yaks below the pass we again rode on down the valley, and striking the head of the Sanju River, continued down it to a Kirghiz encampment, at 14 miles from the pass. We had been descending rapidly the whole way, as this place is at an elevation of 9123 feet above sea-level, the lowest altitude which I had reached

during nearly four months' wandering, having for that time lived at elevations varying from 13,000 to 17,000 feet above sea-level. We were now evidently nearing the plain country, since the mountains here slope rapidly to the north.

On the 21st December we arrived at Sanju, a district containing some 3000 houses, comprised in several villages, situated on each side of the stream in the Sanju valley. Ilchi, the capital of Khotan, lies east from here, at the distance of some 66 miles, or three days journey.

The day we entered here was "Du Shamba," or Monday, on which day the bazaar or market is held. Each town and village in Turkistan has its fixed market-day once a week; and the Sanju one being on a Monday is called the "Du Shamba" bazaar. The place was therefore more astir than usual, and we passed many villagers riding in with their country produce. They all wore the costume peculiar to the agricultural classes throughout Turkistan, consisting of a round cap lined with sheep or lamb's wool, a loose "choga," a description of loose coat, confined by a roll of cloth to the waist, and lined with wool or sheepskin; and felt stockings, with boots of untanned leather. Their costume is nearly all of a gray or drab colour, but on the occasion of some festivity they perhaps don a more gaudy coat, and wear a turban of white or coloured material.

On the 25th December, Christmas-day, I had hoped to have reached Yarkand, but we did not enter the capital of the Moghuls until two days later. On Christmas-day we arrived at Karghalik, situated 79 miles from Sanju, and 36 miles from Yarkand. This is a large town and district, comprising 20,000 houses, and possessing a large bazaar and several caravanserais; and is a place of considerable importance, from being situated at the junction of all the roads debouching across the Karakoram Range into Turkistan from Kashmir, Ladak, and India, as well as the Khotan road through Guma.

I was conducted to a most comfortable serai, and immediately afterwards the chief official of Karghalik, a fine-looking old man, by name Ibrahim Beg, came to an interview. The "dastar-khan," which he sent was most profuse, and exhibited the most unbounded hospitality; it comprised two sheep, a dozen fowls, several dozens of eggs, large dishes of grapes, pears, apples, pomegranates, raisins, almonds, melons, several pounds of dried apricots, tea, sugar, sweetmeats, basins of stewed fruits, cream, milk, bread, cakes, &c., in abundance. In fact, it was enough to feast thirty or forty people; and although there is a saying in Turkistan "that whoever has once tasted Turki hospitality, is so charmed therewith, that he never wishes to leave the country afterwards"—which means that he is

not allowed to—still one could not but confess that however treacherous the Atalik Ghazee might be, he certainly had no intention of killing his guest by starvation.

The following morning, after receiving Ibrahim Beg's profound salâms, and being the observed of all observers, as we rode through the bazaar of Karghalik, we proceeded on to Yarkand.

The whole country from Karghalik is profusely irrigated by the Yarkand and Tiznaf Rivers, and is well cultivated and thickly populated. Large villages are seen on every side, embosomed in fruit-trees of every description while the road itself is flanked by mulberry and poplar trees. Rice, wheat, barley, Indian corn, carrots, turnips, clover, &c., are grown in great abundance; while cotton is largely cultivated. Flocks of sheep and goats are everywhere seen, and the quantities of fowls and pigeons are very great. I noticed a very few ducks and geese, but quantities of wild fowl in the streams and rivers. The sheep are all the broad-tail species, and one specimen was seen which was quite a curiosity. This is a species of sheep with four horns, one pair curving backward like an ibex's horns, and the other pair forward over the ears. The cattle appeared to be small and indifferent, and in colour mostly black and red. 11 miles beyond Karghalik we crossed the Tiznâf River, in lat. 37° 51′ 35″ N.

Continuing our journey the road passes the villages of Khojerik, Alamakun, Boghorlok, and Meklah, immediately beyond which is "Yak Shamba" Bazaar, a large market, and, as the name implies, crowded by the country people on Sundays. Beyond this is the town of Posgâm, at a distance of 21 miles from Karghalik. It is a large place, and, with the immediate suburbs, comprises some 16,000 houses, with a long bazaar and a large caravanserai. The town is watered by the Beshkun Canal, cut from the Yarkand River, a wooden bridge crossing this canal in the centre of the main street leading through the bazaar.

A considerable amount of traffic appears to be carried on. As we rode through the main street it was crowded with people hurrying through the bazaar, while articles of merchandise were being carried in every direction, laden on horses, camels, and donkeys, which latter animal abounds in Turkistan: and is made use of for carrying everything transportable.

The main street, or bazaar, is covered over with a rude roof of matting, which affords a shelter from the sun. On each side the way the shops are placed, consisting of mere booths, ranged in front of the houses, and generally mixed up with no particular regard to the distribution of wares. Butchers and bakers, silk

and cap vendors, vegetable and fruit sellers, all ply their several vocations together, amidst the din and hubbub peculiar to an Oriental mart. After passing through part of the bazaar, the road runs up the right bank of the canal to the caravanserai, situated on some slightly elevated ground. The Serai itself is a large open enclosure, flanked by rows of trees, and surrounded by long sheds for stabling horses; while the east side of the enclosure is occupied by buildings containing several comfortable rooms for travellers.

The plain country, extending from Karghalik to Yarkand seems to slope very gently to the banks of the Yarkand River. Observations of boiling water showed the elevation of the town of Karghalik to be 4570 feet above the sea; that of Posgâm, 4355 feet; and the bed of the Yarkand River near Posgâm, 4180 feet.

On the 27th December, I entered Yarkand, the capital of Eastern Turkistan, so long deemed unapproachable and impracticable to Europeans.

The city itself lies in the form of a parallelogram, being some 2 miles in extent from north to south, and 1½ mile from east to west; the walls thus embracing a circumference of nearly 7 miles. They are from 40 to 45 feet in height, of great thickness, with bastions at each corner, and intermediate flanking defences, and run nearly parallel with the four points of the compass. The city contains some 40,000 houses, and not less than 120,000 inhabitants. It is entered by five gates, from the entrance of the one in the west wall the main street runs nearly due east to the Aksu gate in the east wall. This street is very narrow, being not more than 12 feet in many places. There are 160 mosques, many schools, and twelve caravanserais, which are always crowded with merchants from every country in Asia.

Both the city and fort are supplied with water from several tanks, into which it is conveyed by canals cut from the river. These are frozen in the winter, and the supply is then stopped, but the tanks contain sufficient water for the consumption of the inhabitants until the regular supply is renewed in the spring.

As we rode up the main street, or bazar, the place was crowded with people—sipahis leading their horses out to exercise, merchants passing to and fro from the city, women closely veiled walking or riding on horseback, while a lively traffic appeared to be carried on in the shops on either side of the way. Near the centre of the street we passed several guns drawn up in regular order on the south side of the road. They consisted of five long swivels, two small mortars, and five apparently 4-pounders, all mounted on carriages, with their ammunition-waggons drawn up in rear, and ready

for instant use. The gunners on guard pacing in front of them were immediately recognised as Hindustânees, nearly the whole of the Atalik Ghazee's artillery being served by natives of India. I afterwards conversed with several of these men, and heard related their antecedents and adventures. Many had come round from Peshawar to Cabul and Bokhara, and thence to Khokand and Kashgar, serving the different rulers of those countries, and then changing their allegiance, as fate or fortune ruled for or against them. Several of them had come over to the Atalik when he captured Khotan in 1866 from Habibula Khan, whom they had accompanied from India on his return from a pilgrimage to Mecca, and a few, no doubt, were escaped mutineers of 1857.

Dismounting immediately beyond the guns, I was conducted up a long open passage to the door of the court-yard of the house prepared for my reception, or confinement, as it may be termed, since during a stay of two months in Yarkand I never went outside of the garden attached to the house I occupied excepting when proceeding to interviews with the Governor, and on one occasion when I rode round the fort. I entered the house and found it to consist of two rooms, small but very comfortable, and the floors covered with excellent Khotan carpets. Shortly afterwards the "dastar-khan" of Mahomed Yanus Beg, Dad Khwah, the Shâghâwal or Governor of Yarkand, was brought in by the Mahrum bashees sent from the palace. It was very profuse, and I returned my best thanks, and sent to request the honour of an interview, which was accorded. Having dined and dressed in appropriate Oriental costume, I started for the "urdoo," or palace, escorted by a person of rank. At the distance of about 150 yards from the entrance to the passage of the house I occupied, the main entrance to the place of residence of the chief authorities is reached. The road to it is a prolongation of the main street of the bazaar, and passing through the gateway, a guard-house is first noticed. A covered verandah occupies the front of the guard-house, and extends over the way to the outer wall. Some twenty Turki sipahis were pacing the raised platform under the verandah, or were lounging about in different places; and preciseness and military order were at once apparent, as exhibited by their neat and soldierly bearing, and the display of their arms and accoutrements.

Passing from under the covered entrance the visitor finds himself in a large open enclosure, comprising a garden and tank of water, flanked by rows of trees. The enclosure is subdivided by an intermediate wall, through which lies a way leading to the Kashgar gate immediately opposite. From this enclosure the inner side of the defences is seen. The main wall is crowned by a parapet, below

which a broad way runs all round the fort. Steps at the corners and several gateways lead to the summit of the wall, while higher flights of steps conduct from the walls to the watch-towers at each corner. Facing the embrasures in the flanking defences, or bastions, is situated a row of wooden huts, formerly used as a shelter and cover for their guns by the Chinese. A second gate and guard-house conduct to a paved court of about 50 yards square, surrounded by a verandah, passing across which an inner court of the same size is reached. This second court is surrounded by a verandah on three sides, opposite to the entrance to which, under the verandah on the west side, are the rooms of reception. Not the least elegance or display appeared, but the place seemed to be excessively clean and neat. The official who escorted me stopping at the entrance to the inner court, a Yuzawal bashee, dressed in scarlet silk and embroidery, came forward, and, wand in hand, led the way across the court and up the steps of the verandah to the door of the reception-room. With the exception of two or three Mahrum bashees (pages) the inner court and verandahs were quite empty, and a deep silence reigned around. The room, to the entrance of which I was ushered was a long plainly-decorated apartment, with a bright fire at the further end, in front of which two carpets were spread, covered with scarlet silk cushions. On one of these was seated a little man, plainly yet splendidly dressed in green silk cholah, lined with fur, and a high fur and velvet cap. This was the Dad Khwah, Shâghâwal, who rose and came forward as I advanced, receiving me very graciously and shaking me by both hands. Motioning me to be seated, I assumed a sitting posture on one of the carpets, while he resumed his own, and an interpreter was summoned. This man just entered the doorway and bowed towards the Governor to the very ground, the utmost fear being depicted on his face. By means of this interpreter and my knowledge of Persian we carried on a conversation; and before leaving, after half an hour's conversation, I concluded that the Shâghâwal was a very pleasant, agreeable, and well-informed man. He was evidently well read, while his fund of anecdote was inexhaustible, and he appeared to be very keen and eager to acquire information regarding India and Europe in general. Tea, fruit, and sweetmeats were then brought in by a file of Mahrum bashees, and shortly afterwards I asked permission to leave. As I rose a "khillut," or silk dress, from Khokand was brought forward by an attendant, and in this I was enveloped. I then took leave, again shaking hands, and was conducted back to the house I occupied by the official who had escorted me. Before leaving, I had presented the Governor with some firearms, ammunition, &c., and

shortly afterwards a second "dastar-khan" from him arrived, and I was informed that provisions for myself, servants, and horses, would be supplied regularly every day.

By the 1st of January, a few days afterwards, it was evident that I should be well treated, and was in no immediate danger; but although not officially informed that I was not permitted to go about, the presence of a guard or escort outside the house was a sufficient hint, and I determined to wait a few days and see what would come to pass. My servants were allowed to proceed to the bazar in the fort to purchase anything required; but not until after they had been nearly a month in Yarkand were they permitted to go outside of the fort into the city. On asking to go about on horseback, accompanied by an escort, I was told that it was not the "custom of the country" —the "Andijáni rusmee," the "more Usbeco"—to be allowed to do so until an interview with the King, who was at Kashgar, had taken place. The confinement was excessively irksome after such an active life amongst the mountains; but it was in vain to urge the plea of exercise being needful.

During my stay in Yarkand I succeeded in obtaining eleven observations for the latitude of that city, the mean value of which gave a resulting position of 38° 21′ 16″ N. and long. 77° 28″ E., while several observations of the temperature of boiling water showed an elevation of 3830 feet above the sea. These results all closely coincide with the values obtained by Major Montgomerie's unfortunate explorer, Mahomed Hameed, who died in Ladak on his return from Yarkand, under somewhat suspicious circumstances. The position of Yarkand, as deduced by Major Montgomerie from papers of Mahomed Hameed's, was given as in lat. 38° 19′ 46″ N., long. 77° 30′, and an elevation of 4000 feet above sea-level.

I had several interviews with the Dad Khwah, and at length got off for Kashgar on the 24th February. An escort accompanied me under the command of Mahomed Azeem Beg, an Uzbeg who had followed the fortunes of the Kush Begio since he had left Khokand. I found this man very communicative, and he never tired of relating their late campaigns and extolling the military prowess and bravery of his leader and ruler, the Atalik Ghazee. Passing along the north wall of the fort, the storms of war and siege which the ill-fated Chinese underwent have left their traces in the marks of bullets and cannon-balls with which the wall is perforated.

From here the Kashgar road bears away west, passing the village of Karakoom and Bigil, to where at 4 miles from the city it crosses the Urpi Canal by a wooden bridge. The road is deep in dust, and the traveller is covered with it as it is kicked up by the horses.

The road to Sarikol, and thence to Uakhan and Badakhshan lies up the left bank of the Urpi Canal. It is regularly traversed by Badakhshi merchants residing in Yarkand, who yearly take their caravans of goods across the Pamir Steppe to Badakhshan. Tash Kurgân (or Stone Fort), the capital of the Sarikol district, lies in a W.S.W. direction from Yarkand, at about 175 miles' distance; while the total distance to Fyzabad, the chief town in Badakhshan, is some 460 miles. A journey of from seven to eight days to Taskkurgan, and of eighteen days to Badakshan, is considered very rapid travelling; but the caravans of the traders seldom accomplish the whole distance under the period of one month. The road traverses a plain country for nearly 70 miles from Yarkand, and then crosses a low range into the Sarikol district; and, ascending the valley of the Charling River, crosses the Chichiklik Pass, leading across a high spur of the main Pamir range into the Tashkurgan valley. From Tashkurgan it crosses the pass at the head of the Sarikol territory, and conducts through Pamir Khurd into the valley of the Oxus. The road is practicable for laden horses throughout, and for camels as far as the foot of the Chichiklik Pass from the Turkistan side, and from Badakhshan up to the head of Pamir Khurd from the westward.

We remained five days in Yanghissar, living in a most comfortable serai, which the Atalik has lately had built for his own especial use, since he is in the constant habit of visiting Yanghissar from Kashgar. This was by far the most picturesque place which was seen in Turkistan: the great cause of its attraction being the magnificent view of the lofty Kizil Yart range of the Pamir, which is full in sight, lying south-west and west. Contrary to the usual supposition, that the eastern crest of the Pamir slopes down very gradually into the high plateau of Eastern Turkistan, or the high plain country of Central Asia, the range forming its eastern crest rises into a chain of lofty peaks of 20,000 to 21,000 feet above sea-level, the spurs from which run down most abruptly into the high table-land below. The range thus presenting a steep face towards the plains of Eastern Turkistan, the slope of the watershed will be found to be very gentle, and sloping to the westward: while the waters issuing from the lake-system of the Pamir must, of necessity, drain into the basin of the Oxus. The Kizil Yart range is crossed by high passes leading on to the true Pamir, and it is exceedingly unlikely that any of the Pamir lakes drain to the eastward into the Kashgar River and its tributaries. A high peak in this range, known by the name of Taghalma, lies at the distance of 63 miles W.S.W. from Yanghissar. This Taghalma peak is the most con-

spicuous of any in the range as seen from the eastward, and its approximate height was estimated by observations to be 21,279 feet above the sea.

The town of Yanghissar was found, by observation of the sun's meridian altitude, to be in latitude 38° 52' 3·4" N; and by triangulation, and from its distance and bearing from Yarkand, the meridian of 76° 18' E. has been assigned for its longitude.

The day we reached Kashgar I proceeded to a caravanserai, lying between the fort and old city, and situated on the right bank of the river, and the following morning went to an interview with Mahomed Yakoob Beg, the Atalik Ghazee and ruler of Eastern Turkistan. Passing through the north gate into the fort, a body of Tungâni soldiers, armed with long lances, were first noticed, drawn up on each side of the way; while a guard of Turki sipahis, in scarlet uniform and high sheepskin caps, were grouped around some few pieces of artillery in position near the main entrance. It was evident that the Kush Begie had ordered an extra gathering of his followers in some sort of review order, with a view to exhibiting a military display. Dismounting at the entrance of a large court-yard, I was conducted by the Yuzbashee across this enclosure to the gate of an inner court, where a Yusawal bashee, dressed in the costume and chain-armour of the Egyptian Mamelukes, came forward to say that, if I would sit down for a few minutes, the Atalik would be prepared to see me. I accordingly waited until he returned and ushered me across the second court, which, with the first, was filled with men all dressed in silk and armed. Nothing could be more picturesque than the gaudy display, showing the outward glitter of Oriental pomp and splendour, in the courts where but lately all the horrors of siege and starvation had been endured by the ill-fated Chinese. Their Moslem conquerors had however, effaced all traces of the tragedy; and if cruel and merciless in their religious fanaticism to their foes, their frank and manly courtesy and warlike bearing, contrasting most strikingly with the degenerate and effeminate Chinese, win the good-will as well as excite the admiration of the stranger. Arrayed in every variety of coloured costume, with bright arms and studded accoutrements, they sat or stood in rows under the verandahs as I passed to my interview with the King. Having reached the entrance of the innermost court, I found it to be quite empty, save a piece of ordnance in position, with muzzle pointed towards the entrance-gate. At the farther end of this court, sitting under the verandah in front of his apartments was the Atalik Ghazee himself; and here, as at Yarkand, no display or decoration appeared in the plain

and unadorned buildings of his palace. As if scorning any costliness but that of military display, everything about him is in keeping with his simple and soldierlike habits. Never so happy as when living the hard life of the soldier in camp, or assisting with his own hands to erect forts on his threatened frontier, it is not too much to predict that, were Asia alone in the hands of its native rulers, he would prove the Zenghis Khan or Tamerlane of his age. But, with more sagacity and foresight than those conquerors, he admits the inevitable contact of the strong European races, and bends himself to the overpowering force of circumstances.

The Yusawal bashee who escorted me retiring, I advanced alone, bowed, and then, shaking hands, sat down opposite to the Atalik. He was dressed very plainly in a fur-lined silk choga, with snow-white turban, and in the total absence of any ornaments or decorations presented a striking contrast to the bedecked and bejewelled rajas of Hindustan. I was at once favourably impressed by his appearance, which did not belie the deeds of a man who in two years has won a kingdom twice the size of Great Britain. He is about forty-five years of age, in stature short and robust, with the strongly-marked features peculiar to the Uzbegs of Andijān. His broad, massive, and deeply-seamed forehead, together with the keen and acute eye of the Asiatic, mark the intelligence and sagacity of the ruler; while the closely-knit brows and firm mouth, with its somewhat thick, sensuous lips, stamp him as a man of indomitable will, who has fought with unflinching courage, and, never sparing his own person, has, in the hour of success, been alike stern and pitiless in his hatred to his foes. Although an adept in dissimulation and deceit, the prevailing expression of his face was one of concern and anxiety, as if oppressed with constant care in maintaining the high position to which he has attained. His manner was, however, most courteous, and even jovial, at times. If report speaks true, his bed can hardly be one of roses, as it is said that the danger from some secret assassin's hand is so great that he never remains for more than one hour in the same apartment during the night. The few presents which I had brought for the Atalik were delivered, and a man was summoned to interpret, who remained standing at some short distance, on the ground below the verandah. The conversation was at first the usual Oriental etiquette; and shortly afterwards the Atalik Ghazee expressed a hope that the English would in future visit his country, as hitherto they had been prevented from entering Central Asia by the Bokhara tragedy, when Colonel Stoddart and Captain Conolly were murdered by the Ameer of Bokhara in 1842. He then pre-

ceeded to say that another European—meaning Schlagintweit—had also been killed in this very place, Kashgar, by a robber named Nullee Khan, who, relying on his spiritual influence as one of the seven Khojas, overran the northern provinces of Eastern Turkistan with a wild rabble of unscrupulous followers in 1857 and 1858, executing and murdering the most innocent people for the mere sake of shedding blood. The Atalik, however, never mentioned that he had himself involuntarily avenged the murder of Schlagintweit; and this he might have averred, for he cut Nullee Khan's throat two years ago. After a short conversation, I took leave, and was conducted to the house of the Yusawal bashee, in which quarters were assigned to me during my stay in Kashgar. It is almost needless to say that the same strict *surveillance* was exercised here as at Yarkand, and I was not permitted to go about. This was more especially the case when staying in the larger towns; but when on the march, and moving from place to place, the *surveillance* of the escort somewhat relaxed, and greater liberty was enjoyed. I remained in Kashgar for upwards of a month—from the 5th March to the 13th April—and during this time took observations as opportunity offered. The resulting position obtained for the fort was in latitude 39° 19′ 37″ N.: and by its distance and bearing from Yarkand it was found to be in longitude 76° 20′ E.; while the elevation of 4165 feet above sea-level was determined from observation of the boiling-point of water. The position of the city of Kashgar, lying directly north from the fort across the river, was estimated to be in latitude 39° 23′ 9″ N., and in the same meridian of 76° 10′ E.

I left Kashgar, on the return journey, as the sun rose on the morning of the 13th April. It was one of those perfectly clear days so characteristic of the climate of Eastern Turkistan; and, in the grand display of the mountain masses around, offered an ample compensation for the long detention and delay which had been experienced.

Lying north, immediately beyond the Kashgar River, appears a low undulating ridge of ground, from which the transverse slopes run down very evenly and gently into the level plain beyond the river. Beyond this, again, an irregular rocky range occurs, presenting a steep face to the south, an opening in which admits the exit of a stream flowing with a south-easterly course to its junction with the Kashgar River. A road conducts up the valley to the village of Tajend, beyond which is situated the fort of Aksai, commanding the route debouching across the Snowy Range to the north by the pass of Tailâk. To the north-east, in the far distance, appear the slopes

of the Artush Range, branching from the great Thian Shan chain of Central Asia, while, conterminous with the horizon to the north, this Snowy Range stretches with an even crest at nearly 70 miles' distance from Kashgar. The direction of the range is from W.S.W. to E.N.E., while the spurs slope evenly, and with a regular alternation, to the south and east. The Artush Valley is seen throughout a considerable portion of its length to where it deflects to the northward.

The stream rising in the pass at its head has at first a course to the south-east and then to the southward, and again flowing eastward after leaving the lower hills, forms one of the tributaries of the Kashgar River. But very few peaks in the Snowy Range appear to attain to a greater height than 18,000 to 19,000 feet above the level of the sea; and the crest of the chain, as before mentioned, presents no alternate lofty summits and deep depressions so remarkable in the chains of the Kuen Luen and Karakoram. The appearance of the range, as seen from the southward, is somewhat desolate, since no forests occur to break the interminable view of the bare slopes of the mountains with their snow-crowned summits. Although forests are found on the northern slopes in the basin of the range, yet no trees are visible from the south, or, at any rate, no timber of sufficient height to be seen at the distance of Kashgar. It is not known with any degree of certainty to what altitude the passes across the range attain; but if the mean elevation of 15,800 feet is assigned to them, this measurement is, in all probability, sufficiently accurate for an approximate calculation.

Looking west and south from this point of observation is seen the whole Kizil Yart Range, forming the eastern crest of the Pamir, surmounted by snow-capped peaks and glaciers. It would be impossible for any scene in nature to surpass the vast grandeur of these mountains, as seen towering up like a gigantic wall with the well-defined outline of their lofty summits cutting the clear azure of the sky. The lines of Pope at once occur to the observer with striking appropriateness:—

> "Eternal snows the growing mass supply,
> Till the bright mountains prop the incumbent sky,
> As Atlas fixed each hoary pile appears
> The gather'd winter of a thousand years."

It was a scene that could not fail to be indelibly impressed upon the memory; and the more so from the circumstances under which it was beheld. The Russians, our friendly rivals in the noble science of geography, had already reached to the crest of the range now in sight to the north; and here, in the very heart of Central

Asia, it was gratifying to know that at length, through the medium of British enterprise, had been determined the much-vexed question of the position of Kashgar.

From here again was noticed the very abrupt and rugged declivities of the lofty Pamir Range, which, trending northward to its junction with the Artush, was visible at the head of the open valley, through which flows the Kashgar River. The point of junction of the two chains could not be seen at such a distance, but some lofty isolated peaks were discernible towards the Terek Pass as the rays of the morning sun lit up their sunny crests.

The thermometer at Yarkand rose from a temperature of 23° Fahr., at noon, in the commencement of January, to 71° and 72° Fahr., at the end of May. As the mercury probably indicates a temperature of 82° or 85° during the months of July and August, which is undoubtedly the hottest time of the year, Eastern Turkistan thus experiences alternate periods of great heat and excessive cold. And as in countries where ranges of mountains intercept the course of the prevalent winds, being enclosed on the north, west, and south by lofty chains of mountains, a peculiarly dry climate is here met with.

We remained another month in Yarkand, since all the passes on the southern frontier were reported by the Kirghiz to be impracticable up to the end of May. The welcome news at length arriving that the Sanju Pass was practicable for laden yaks, we bid farewell to the Dad Khwâh, the courteous and hospitable Governor of Yarkand, and started on the return journey to Ladak on the 30th May.

A cursory glance at the map suffices to show that the most direct route from the North-West Provinces of India to Yarkand must, after reaching Chang Chenmo, cross the main chains of the Karakoram and Kuen Luen, and the intervening high land of Aktâgh, in a general direction bearing N.N.W. I have endeavoured to show that the true road into Eastern Turkistan from Aktâgh is down the valley of the Yarkand River and across the Kuen Luen Range by the Yangi Pass, and it remains to point out the most direct route by which Aktâgh can be reached from Chang Chenmo. This is the route we followed on our return; and from the Chang Lang Pass, leading across the Karakoram Range, traverses the western side of the Lingzi Thun Plains, and entering the upper valley of the Karakash River, conducts down that valley and across the Karatâgh Pass to Aktâgh.

This would certainly be the direct road for a caravan to follow coming from Upper India, and wishing to avoid Kashmir

and Ladak; and, having traversed it myself, I can vouch for its excellency and perfect practibility for laden horses and camels. Indeed, the natural advantages of this line are so great, that, from Chang Chenmo to Kooluncooldee, in the valley of the Yarkand River, a distance of 240 miles, a little labour expended on the construction of a road up the Chang Chenmo Valley would render it practicable for two-wheeled carts and conveyances. There are, too, the immense advantages of grass and fuel obtainable all down the upper valley of the Karakash, so that this line not only avoids the difficult passes of Sasser and Kardong, on the Ladak side of the Karakoram, as well as the Karakoram Pass, but possesses the great desideratum of affording grass and fuel on that portion of the route where it is most essential.

It is desirable to draw especial attention to this line of communication, since what is capable of being converted into an easy trade-route may be made equally available for military purposes.

The memoir will be published entire in the 'Journal,' vol. xl., with the author's map.

The PRESIDENT spoke as follows:—"This is a communication of the very highest order of merit. The author, under the greatest difficulties in the wildest and most inaccessible of countries, inhabited by Mussulmen, many of whom would have put him to death had they detected him making astronomical observations—had succeeded in admirably unravelling the natural features of a region hitherto most imperfectly known, and has fixed the latitude and longitude of places never before geographically surveyed, and never before visited by an Englishman.

"Who, for example when our medallist Dr. Thomson first traversed the Karakoram chain in 1848, or subsequently (between the years from 1854 to 1858, when the brothers Schlagintweit traversed that same chain (one of them, the adventurous and unfortunate Adolphe, having even reached Kashgar), who, I say, could then have thought that the day would soon arrive when these savage territories, extending northward from the frontiers of Kashmir, would be so thoroughly explored and surveyed as they have now been by Mr. George Hayward, who has determined their true topography by numerous astronomical observations. We must indeed admire the courage and great ability displayed by Mr. Hayward in having thus so successfully carried out (certainly beyond my anticipations) the mission which we had entrusted to him; and I confidently believe that if is life be spared, he will terminate his researches by a thorough delineation of the geography of the wild Pamir Steppe, in which the rivers Oxus and Jaxartes take their rise in that lofty plateau which was explored by our honoured medallist Lieutenant Wood, R.N., in the year 1839, when he performed, for the first time in modern history, a pilgrimage into these wild countries of the Kirghis, and visited the sources of the Oxus. But if Mr. Hayward should add no more to our knowledge than that which he has given to us in this our communication, he has already entitled himself to receive the highest honour we can bestow upon him. We now see that his scientific observations are enhanced by most exquisite artistic sketches, which are now brought before us in various coloured landscapes, re-

presenting these grand and hitherto inaccessible regions. And we also feel that his pen is that of a ready and attractive writer.

"There are many collateral circumstances which invest Mr. Hayward's memoir with surpassing interest; for, now that we have before us his graphic pictures of this large portion of Eastern Turkistan, we know that these also are the very tracts which recently have been opened out to commercial enterprise by our associates Mr. Douglas Forsyth and Mr. Shaw, who have indeed done good international service in bringing about the most friendly relations between the powerful ruler of Eastern Turkistan, the Ataligh Ghazee, and our countrymen in British India. Nay more, I happen to know (and I relate the fact with great satisfaction) that our rivals in the extension of geographical knowledge, the Russians, who have recently done more than all other people in delineating the true geographical features of Central Asia, view this opening out of Eastern Turkistan to our commerce with no jealous eye; but, on the contrary, are quite content that we as well as themselves should trade with this new native power, which has consolidated itself since the Chinese have completely abandoned it. Nay more, I know from Mr. Douglas Forsyth, that the Russian authorities, including even his Imperial Majesty and his minister, Prince Gortschakof, have assured him in a recent journey to St. Petersburg, that so long as the Ataligh Ghazee (Yakoob Koolibegi) confines his rule to the country lying between the Thian Shan and the British territories or Tibet, they will not interfere with this Eastern Turkistan, which is now entirely independent of China. Thus, we may hope that these vast intermediate tracts may prove to be a prolific source of commerce both to the Russians, who have long traded with them, and to ourselves, and be the means of bringing about again the most friendly relations with our old allies.

"But passing from this important international consideration, to which, as most of those present know, I adverted in several of my anniversary addresses, I must say that, in a purely geographical sense, the researches of Mr. Hayward and their results have given me the sincerest gratification, inasmuch as they have to a great extent sustained the broad views of the late Alexander von Humboldt. In the 'Asie Centrale,' of that illustrious geographer, his sagacity and learning brought out in 1843 a general sketch-map of all Central Asia. And in it we see that these great salient features by which the Kuen Luen Mountains are laid down as a distinct chain, separated from the Himalayan and Karakoram chains on the south as from the Thian Shan on the north; whilst, in their western prolongation, these chains are traversed by the Bolor, of which the high Pamir plateau forms the eastern edge.

"In mentioning this happy confirmation of the original views of my illustrious and lamented friend by the actual researches of Mr. Hayward, I beg to remind the Society that M. Pierre de Tchihatchef is now preparing a new edition of the 'Central Asia' of the illustrious Prussian geographer, in which he will sketch, with his well-known perspicuity, all the highly important additions which have been made by the Russians in their advance over Western Turkistan, which, whether in their occupation or under their influence, promises to become a fruitful source of industry and commerce as soon as order is introduced into countries which have for many ages been a scene of turbulence and warfare."

Sir H. RAWLINSON said Mr. Hayward's travels afforded another proof that geographical discovery was not a mere dilettante amusement, but was intimately connected with the public interest. Since the expulsion of the Chinese from Kashgar and Yarkand commercial intercourse between Turkistan and India had been suspended, except a small traffic carried on by Kashmirees. This infrequency of communication, and the tendency to exaggerate remote dangers, had created mysterious rumours in India with regard to Russian designs beyond the Himalaya. The explorations of Mr. Hayward

and Mr. Shaw had restored commercial confidence, and shown that the Russians were still a thousand miles from Kashmir, and had no intention of making any forward movement. All the country, from the Punjab frontier to the confines of Eastern Turkistan, was dependent upon the Maharajah of Kashmir, the ally of the British Government. From the outlying villages beyond Leh to the frontier of Turkistan, a distance of about 400 miles, there was not a single house, hut, village, or other inhabited place—the country was a howling desert; and it was over this region that Mr. Hayward had passed. The Himalaya branched off into two main ridges extending north-west and south-east; the southern of these ridges was called the Karakoram range, and the northern the Kuen Luen. Notwithstanding what had been said about the facility with which a Russian force might cross to India by the Chang Chenmo Pass, the fact was that beyond that pass lay the more formidable obstacle of the Kuen Luen chain. Until recently it was believed that there was only one pass over that lofty range, and that that was impracticable to laden cattle; but the great point of Mr. Hayward's discoveries was that he had found another pass—the Yangi Pass—which was much easier than the Sanju Pass. Still, owing to the attacks of the Nagayr robbers, the easier pass was not much used, but the establishment of a fort there would open up a really good commercial route. Baron Humboldt had always maintained that there were two great chains running through this part of Asia, and that where they approached each other they were connected by a transverse chain. Mr. Hayward had fully established the truth of that view, and had also shown that the rivers rising to the west of the transverse chain flowed towards the Oxus, while all those rising to the east flowed towards the centre of the Chinese empire. From 1759, till about six or seven years ago, the country through which Mr. Hayward had passed belonged to China, but, owing to the disruption of the Chinese empire, the Tunganis rose in rebellion and took possession of Yarkand. These Tunganis, themselves a foreign race, had since been driven out by the people of Kokan, under the Ataligh Ghazee, who now held sway. The opportunities which the visit of Mr. Hayward and Mr. Shaw to Yarkand had given of establishing commercial relations between India and Turkistan had not been overlooked by Lord Mayo, who had directed the Governor of the Punjab to enter into arrangements with the Maharajah of Kashmir for surveying the routes and opening them to traffic.

Mr. WYLIE observed that, whereas he had formerly felt bound to look askance at Mr. Hayward's and Mr. Shaw's expeditions as involving a certainty of great perils out of all proportion to the possible profit, he now felt that arrears of credit were due from him towards those enterprising gentlemen. Their safe return had practically disposed of his misgivings. He congratulated them most cordially on their grand success.

In reply to a question from Mr. George Campbell,

Sir H. RAWLINSON said that, though Mr. Hayward had not actually ascended the Yangi Pass, he had seen it and conversed with those who had done so with laden mules.

Dr. LEITNER explained the use of several articles of Yarkandi manufacture, and the meeting was adjourned to the 10th January, 1870.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *Suez Canal, with Directions for its Pilotage.*

(Communicated by Capt. G. H. Richards, R.N., Hydrographer to the Admiralty.)

The following information has been received from Commander G. S. Nares, of Her Majesty's Surveying-vessel *Newport*, which vessel passed through at the opening, November, 1869:—

The coast in the neighbourhood of Port Said is unusually low, being out of sight at 3 miles distance. The lighthouse, town, and shipping are the only objects seen from the offing.

At present there are two tall obelisks, one on each side of the Canal entrance, but as they are merely built of boarding, they can only be temporary. At 6 miles to the west the coast is marked by Gemileti Tower—a low, square building standing by itself on a low sandy coast; but to the eastward of the port there is nothing to mark the low shore.

The current off the coast is very uncertain. It generally runs with the wind, from half to 1½ knot an hour. The general set is to the eastward. Owing to the current and low shore, more than usual caution is necessary in approaching the harbour.

The harbour is formed by two concrete breakwaters running off from the sandy shore. Inside the piers the harbour is at present constantly silting up, in consequence of the current, heavily laden with sand, running through numerous openings in the piers, and depositing the sand in the quieter water inside.

A good, straight channel of 26 feet of water has been dredged, leading into the inner basins, about 100 yards inside, and parallel to the west pier. It is marked by black buoys on the east side, and red ones on the west side; and it may be presumed that the authorities will be careful to keep it clear.

The basins inside the harbour have a depth of 26 feet water; they are sufficiently large for the trade which may be expected. If not, there is ample space for enlarging them.

On the outer end of each breakwater there is a low light—*red* on the west pier, and *green* on the east one. The Port Said lighthouse is a tall white stone tower, 180 feet high, standing close to the inshore end of the west breakwater. It shows a flashing white lime-light, visible 18 miles. The pilot boats carry a blue peter flag.

The best anchorage in 6 fathoms is with the low red light on with the high lighthouse; or the west pierhead a little open of the lighthouse on either side. The bottom is mud and very good holding-ground. A bank with 12 feet water has been formed to the eastward of the harbour. The east pierhead light (green) on with the high lighthouse leads over the west edge of the bank; therefore these marks must be kept well open.

In approaching, allowance must be made for a bank which is forming outside the west pier end. In November, 1869, there was 6 fathoms at half a mile from the pier end, with the anchorage marks in one.

The entrance to the Canal is conveniently situated at the inner end of the basins.

The usual depth of water is from 26 to 29 feet; immediately south of the Campement de Cap is a short bank of 24 feet: and one mile north

of Kantara, opposite the 43rd kilometre mark, is a bank of 23 feet. The whole of this distance, 24½ miles, with the exception of one-sixth mile at the Campement, which is higher, the Canal runs through a wet flat sandy plain, scarcely higher than the level of the water on the east side, and a little below it on the west side, which, with a "high Nile," is completely overflowed, and the sand rendered firm by the deposit of mud from the river. In this part of the canal there is no sand-drift, and it may be considered as completed. The *débris* thrown up on the banks is firm, black, sandy mud, protecting the Canal from the water in Lake Menzaleh, without any opening in the whole distance.

The Canal passes through sand-hills from 20 to 30 feet high, and has a depth of from 26 to 28 feet. This part of the Canal is completed, but it is subject to a severe sand-drift in high winds.

The Canal here passes through a lagoon, with a depth varying from 19 to 24 feet, but the dredges are still at work. There is constant trouble in this part of the Canal in consequence of the banks on each side, which are composed of fine sand *débris*, not being firm enough to resist the constant ebb and flow of the water between the lake and the canal, which, carrying large quantities of sand with it, is constantly altering the depth of water. In this cutting the sand-hills are about 40 feet high. The depth in the Canal varies from 22 to 24 feet, but there is work still going on in the shallow parts. All this part is subject to heavy sand-drift.

For about 4 miles in the neighbourhood of El Guisr the Canal is cut through a stratum of soft lime or sandstone. The sharp turns between El Guisr and Lake Timsah are probably owing to the engineers having followed the softest part of the rock. Ships can pass round the curves without trouble.

The central station in the Canal is well situated for a stopping-place. There is at present only 22 feet in the middle of the lake, but the dredges will soon give deeper water. The depth varies from 22 to 27 feet, except one bank of 20 feet in the Lagoon. The *débris* banks here, of pure sand, like those in Lake Ballah, are not adhesive enough to form a barrier between the Canal and the Lagoons, to keep the silt from running into the channel; but the Canal is sufficiently wide to allow dredges to work *without stopping the traffic*.

In this cutting the Canal is carried through a stratum of sandstone with depths from 22 to 24 feet, except in one place one mile south of Serapeum, where, for about 30 yards, there is a narrow ridge with only 18 feet water over hard rock. A strong party of men are at work, and the obstruction will soon be reduced. At the south end of the cutting the deep channel is narrow and incomplete. This cutting is subject to a very heavy sand-drift. From the *débris* on the bank it would appear that the narrow ridge of stone running across the Canal had only lately been discovered.

The margin of the deep water in the Lake, 1½ mile from the entrance, is marked on the east side by a red iron pillar-lighthouse 40 feet high, showing a fixed white light visible 10 or 12 miles.

The excavated channel leading into the deep water has a depth of from 24 to 29 feet. It is conspicuously marked on each side by iron beacons, 15 feet high, with a black ball, 3 feet in diameter, on the top. As we passed, each beacon was lighted, but whether the lamps are to remain could not be ascertained.

The margin of the deep water at the south end of the Lake is conspicuously marked on the east side by a lighthouse similar to the north one, and by a buoy on the west side.

A straight run may be made between the lighthouses (a distance of 8 miles) with not less than 22 feet depth of water; 26 feet may be obtained by passing nearer to the west shore of the Lake. The water in this part of the Lake being shallower, a cutting has been made giving from 26 to 27 feet depth. The channel is well marked by numerous iron beacons on each side (from 4 to 6

to a mile) similar to those at the north end of the Lake. This part is quite complete, with hard banks, and depths of water from 26 to 30 feet at low water. It is subject to sand-drifts.

At Chalouf the cutting is carried through sandstone; the *débris* is hard and lumpy.

South of latitude 30° 6′ N. the Canal passes through sand-hills; it increases in width, and the *débris* on the bank is more than usually large.

At Madama the banks are of firm marl or soft clay. This part of the Canal is incomplete; the *débris* banks are sand. The soundings were irregular, the depth varying from 21 to 26 feet at low water. A large number of men are still at work here.

At the entrance a good stone wall is built on the west bank, but it requires to be raised and extended. Another is much wanted on the east side, where the curve already shows the usual signs of scouring out on the outer and depositing on the inner side.

The south end of the Canal may be said to extend 1¼ mile beyond the two red lights, passing the Suez creek and the new dock and harbour works, into the Gulf of Suez with not less than 27 feet at low water. With a flood tide a great quantity of silt pours into the Canal from the sand-bank on the east side of the entrance, but doubtless means will be taken to prevent it.

A breakwater has already been carried across the sea face of the bank.

The mouth of the canal is marked by a *red* light on the west side at the extreme end of the new harbour works, and by a *green* light on the opposite side on the nearest end of the breakwater. Both lights are at present only hoisted on temporary poles. Outside these marks the channel is further shown by a line of buoys, white on the east side and red on the west side.

The dry dock is 430 feet long, 83 broad, and can dock a ship drawing 23 feet when the channel outside is completed.

The current depends on any variation in the height of the water in the Mediterranean. The banks shew that the Canal here is subject to a rise and fall of one foot, the current and height lessening as the distance from the entrance increases. There is no tide or current in Lake Timsah or the Upper Bitter Lake. The tidal influence extends from Suez to 4 miles north of the southern end of the Bitter Lakes. The stream commences to flow from 2 to 3 hours after low water at Suez.

A spring tide rises 6 feet at Suez, 2 feet at Madama, 1¼ at Chalouf, and half a foot at the south entrance of the Bitter Lakes. At Kabiet there is no rise and fall. The immense reservoir of water in the Bitter Lakes with an ebb tide, and in the Gulf of Suez with the flood, will prevent the tide ever having a greater range.

With a strong southerly wind in the Gulf of Suez the water rises to from 8 to 9 feet at the head of the gulf, and may affect the water in the Canal to some small extent.

From 2 to 3 hours before high water at Suez the flood with a spring tide was running 1¼ knot at Chalouf, increasing to 2 or 2¼ knots at Madama, with the water very much discoloured.

By starting from Suez an hour before low water a vessel will arrive in the Bitter Lake before the flood tide overtakes her, and having nearly slack water all the way.

Every 5 or 6 miles a short widening in the Canal (a gare) gives room for a vessel to haul in and allow another to pass her with ease. Vessels can pass each other at any part by using warps, but they cannot do so without stopping, except at great risk of running on shore and delaying the whole traffic of the Canal. A single ship could pass through in from 14 to 16 hours; and two small ships, entering one at each end, could pass each other without slackening speed. But it is impossible to carry a train of large ships through in one day.

Lake Timsah and the town of Ismâïlia are conveniently situated and suffi-

ciently large for a stopping-place; and doubtless arrangements will be made for ships to start from each end on one day, for all to meet and anchor for the night at Lake Timsah and to start for their respective ends the following morning. This, allowing 8 hours for passing through each end of the Canal, and 12 hours for remaining at Ismailia, will give 28 hours for the transit.

With a full moon a handy ship, by entering the Canal in the evening and arriving at Ismailia in the morning early enough to join the train of vessels, might perform the voyage in from 16 to 20 hours. With a train of only two or three ships, and no delay at nights, the transit would occupy about 18 hours.

There is no doubt that every vessel will cause more or less damage to the banks on passing, but screw-ships only going 5 or 6 knots will hurt the Canal very slightly, except in the lagoons, where the banks are formed of very fine sand. The *Peru*, a large paddle-wheel steamer, on passing with great speed (8 knots), and displacing the water in the whole breadth of the Canal, did considerable damage, the wave she made swamping several boats. Large vessels should be made to reduce speed more than small ones.

Should a vessel touch the ground in any part of the Canal, except in the tidal part at the Suez end, she will sustain no damage, merely being thrown out of her turn in the line. A good coating of sand has formed at the bottom of the Canal in the sandstone cuttings.

In the tidal part near Suez, if a vessel is passing through with a following tide and the bow touches either bank, there will be great danger of her swinging across the Canal, with a 2-knot current running against her broadside. With a wind blowing across the Canal, vessels touching the lee side will be blown at once against the bank, but without any damage.

The present pilots will rapidly gain experience; with trained leadsmen and a lead going on each side of the ship there is no difficulty whatever in navigating the Canal and keeping in mid channel. Should a bank form, it will be at once detected, and ample means are ready for reducing it.

The precautions necessary are similar to those in any river, with the advantage of there being fewer and better curves, and nearly a straight course throughout.

Thirty-five miles of the Canal is subject to the sand drifting. One squall was experienced (force 6) when the drift was as thick as an ordinary fog, and most distressing to the eyes; so much so, that had the ship been in a curve at the time, there would have been great difficulty in keeping her in the proper channel. Fresh-water pipes run along the west bank of the Canal for the greater part of its length, and doubtless, as soon as the water is no longer required for the engines, it will be used to irrigate the banks and endeavour to stop this nuisance.

In the total 86½ miles, 65 may be considered as quite completed. Throughout the remaining 21½ miles there is either dredging or embanking work still going on. For 5 miles in the worst parts of Lake Ballah and the Lagoons south of Lake Timsah constant dredging will be required, until means are found to keep the banks solid enough to prevent the waters communicating.

In the Serapéum cutting there is a rocky ridge of a few yards with only 18 feet water upon it, which will soon be removed. Except for about 10 miles there is 24 feet of water throughout the canal. Vessels drawing 17 feet can pass through with ease. When the barrier at Serapéum is removed the Canal will be open to ships drawing 20 feet.

The largest ship that passed through the Canal at the opening was the *Péluse*, Egyptian yacht, drawing 16 feet, about 250 feet long. Several ships grounded on the passage, but all got off again with a little delay. The grounding was caused more by the desire of the 40 or 50 ships to get quickly through, than through any fault in the Canal.

Geo. Henry Richards, Hydrographer.

2. *Notes on the Rivers in Northern Formosa.* By Henry Kopsch, F.R.G.S.

Long as the island of Formosa has been known to navigators, and though visited by Europeans centuries ago, our knowledge of its geography at this period is exceedingly meagre. The extreme skirt of the island is all with which we are as yet acquainted, and that but imperfectly. Though the northern and southern ends of the island were settled by the Dutch as early as 1624, who fortified themselves at Tamsui and Taiwan-fu, the only traces of their former occupation of the island are the ruins of their forts—Fort Zelandia at An-ping, and the Red Fort at Tamsui, with a few cuttings of names found in a cave at Palm Island, Keling, copies of which I subjoin, deeming them worthy of preservation. The names found were—

Hans Hubener. 1664 Schetek. [A E] 1666.

Hans Henrick Rotterdam. Jacob Bosch. [H T F] 1664.

Nicolas Gros. A C 1667.

A residence in Formosa naturally inspires one with a desire to become better acquainted with the interior of this unknown island; but the explorer is sorely disappointed to find that admission to this secluded spot is almost impossible, owing to the presence of a hostile race of savages throughout the island, who glory in the murder of Chinese, and since in these latitudes it is difficult to travel without such assistance, one is debarred from penetrating the interior.

Knowing that any attempt to make a hasty entry into the savage territory would be fruitless, we determined to commence our peregrinations away from the savage territory, which also offers a large and interesting field. The north end of the island is well interspersed with streams, few of which are marked on any maps, and those that are we found to be placed incorrectly.

We will commence an account of our voyages by giving a description of the native boats employed inland, their construction being somewhat peculiar, but so well adapted for navigating shallow rivers and ascending rapids that a short notice on their properties may be of interest and use to explorers. In the construction of vessels of light draught, combining comfort and capacity, the Chinese are not backward. The dimensions of our large boat were as follows:—Length 35 feet, beam 7 feet, depth 3 feet, mast 30 feet high, with a bamboo-ribbed sail. They are entirely built of camphor-wood planks one inch thick without a join from stem to stern, and, in addition to the planks being nailed to the ribs, nails are driven in—perpendicularly (a fashion with Chinese boat-builders)—to fasten the planks together. The boat has in all 7 ribs, the first from the bow being built up to form a watertight compartment when required, and the whole is decked over with loose planks. The first rib from the stern is also built up into a compartment in which the small clay cooking-furnace is stowed away; the centre of the boat is thus left for passengers or cargo. Chinese naturally sit *à la Chinois*, and they sleep in their boat athwartship; but the mat-covering may be raised high enough for an ordinary sized man to stand up under. Our boat, with six men in her, and some 300 lbs. of baggage, &c., drew 6 inches of water. Two natives composed the crew when sailing or pulling in open water; but on ascending rapids a third man is engaged, to keep the bow up-stream—two being required to push at the bow, while a third pushes astern, thus the flat-bottomed craft ascends the rapids.

Light as the draught of these boats may appear, in some parts we had to procure smaller ones, which may be lifted by four men over any obstacle. Being flat-bottomed, they can only sail before the wind, and their tall mast and large spread of canvas enables them to do so with great speed. For travelling in warm latitudes they are very comfortable and commodious.

In December, 1867, we left Tamsui with a view of exploring some of the affluents of the stream known as the Tamsui River, which debouches into the sea at *Hu-tsei* (Tamsui). The first town we reach is *Méng-ka* (Bancs), the commercial capital of the district, and residence of the chief authority. The voyage took about four hours, an unusually long time, we being unfavoured by wind, and the passage is much prolonged by having to steer a very winding course to avoid sand-banks. Beyond *Méng-ka*, which is distant about 12 miles from *Hu-tsei*, navigation for junks ceases, and that city can only be reached by large boats at high water, there being less than 3 feet in some parts of the river at low water; the tide, however, rises from 7 to 9 feet. Opposite *Méng-ka* the river branches off to the s.s.w. leading to *To-ko-kam*; but we followed up the south-east branch, intending to ascend the first affluent we met. Rapids of small size begin to appear soon after leaving *Méng-ka*, and become more numerous and shallow on approaching the village of *Ku-lun-au*, where the river increases to a considerable width, with endless brawling rapids and dry patches dividing its course. *Ku-lun-au* is a picturesque little village situated on the left bank, and is surrounded by clumps of feathery bamboos.

The neighbourhood was richly cultivated with sugar-cane, hemp, and vegetables, and considerable boat traffic was observed on the river. Fish of an excellent quality were procured here, resembling mountain trout. They are caught by dragging a rope with feathers fastened to it, by means of which the fish are attracted and then netted. Continuing our course over shallow but broad water for a short distance we came to an affluent on the right bank, up which we decided to go, the main river we were about to leave heading to *Chin-tam-ki*. At the mouth of the new branch we were greeted by a troublesome rapid which debarred our progress, nor could we manage to pass it without getting out and lending a hand to our crew. Going on for about a mile through the most enchanting scenery, we reached a village called *Kung-tao-au*, situated at the foot of a pretty green hill about 150 feet high. Here we halted for the night, just far enough from the village to avoid being stared at by inquisitive natives.

The night was perfectly summer-like, and, in fact, the thermometer was standing at "summer heat" during the day. Small flies were troublesome by buzzing round the lights, but no mosquitoes visited us.

The river was as clear as crystal. We did not proceed far the following morning without encountering many rapids, some being too shallow for our large boat to ascend. Luckily, at a small village, we procured two smaller boats, and after transhipping our baggage and servants into one boat, and keeping the other for our own use, we resumed our course. The agriculturists in this vicinity are very well-to-do people: the women and children were clad in gay-coloured garments; the men were strong and healthy-looking fellows. Passing more rapids and shallows we reached *Kiung-pih*, famous for its aqueduct which crosses the river at this village. This useful structure—the labour of many years and cause of much bloodshed between the Chinese and aborigines—was built by a wealthy colonist, named *Ban-Kee-tao*, for the purpose of supplying the commercial town of *Méng-ka* with sweet water (the river water just there being brackish), and to afford easy means of irrigating the land. After going under the aqueduct and through countless rapids we at last reached a good long expanse of clear water free from shallows or rapids, about 50 yards wide, lined with bamboos on each bank. A well-cultivated valley extends for about a mile on each bank of the river, terminating at a high range of wooded hills. This pleasant sailing did not last long, for after passing a tiny village, called *Shih-i-sung*, where dyeing was going on, the river became an endless string of rapids too numerous to be mapped down. The scenery in this vicinity presents every imaginable feature, well meriting the name of Formosa. On the left bank were lofty hills well wooded with pines, while close to the water's edge are immense beds of ferns, bamboos, and

entangled masses of creepers, the *tout ensemble* forming such an enchanting landscape that we named it "Fairy Knoll." Huge boulders lie scattered in the bed of the river and on the banks, one of which is said to rock with the wind. About here we saw coal cropping out of the hills. Most people would denounce this river at its upper end as unnavigable; but, with the admirable boats and perseverance of the Chinese, the ascent is accomplished with comparative ease. Owing to the unusually dry season, there was so little water that in some parts it seemed really impossible to get up such a small but swift stream; still, boats laden with grain were being pushed up by sheer strength.

At about 5 P.M. we reached a small village, called *Pung-a-na*, situated at the foot of a high range of mountains, where the river ends in a mountain torrent, and all navigation ceases.

Learning from the natives that we were not more than two hours' walk from *Liang-Kah*, we determined to try and reach it that night, so, procuring a guide, and entrusting our blankets to our coolies with orders to follow, we started off through the mountains on our unknown route. The first part of the road took us along the bed of the river we had just left, after crossing which we climbed up a steep hill covered on its summit with stunted firs and common tea-plants. Before we reached the top of the mountains it began to grow dark, which at once caused us to entertain doubts as to our blankets, &c., following, the road being terribly bad. After walking through jungle, and paddy-fields in the low land, we had to cross a second range of hills equally high, the darkness of the night making it most difficult to keep the path. Half-way up the mountains the inmates of a hamlet kindly provided our guide with a torch, but it was unable to stand the gusts of wind and rain experienced at the hill-tops. Five hours' most unpleasant walking from *Pung-a-na* brought us to a large village, which we hoped was *Liang-kah*, but to our chagrin found it to be *Chin-teng-kah*, some 15 miles down the river. Having ordered our baggage to go to *Liang-kah* it was useless to stay here, so we marched on to the former place, arriving there after a walk of nine hours from *Pung-a-na*. The owner of a rapid-boat most hospitably offered us shelter from the rain, and cooked a meal of rice for us. His kindness did not end here, for he provided us with as much of his bedding as he could spare, upon which the three of us slept. Our baggage was destined never to come by that route, the coolies having refused to cross the hills by night. We returned to Tamsui *viâ* the Ke-lung River.

A graphic description of this river having already appeared in the Society's 'Journal,' vol. xxxiv. p. 8, it will suffice merely to add a few remarks concerning the places of interest along its banks.

About 8 miles from Tamsui, and 4 miles from the river, are the sulphur springs or pits situated in a small sheltered valley in the high range of hills running towards Ke-lung, at an elevation of 450 feet. At the foot of these hills is a good-sized brook of clear warm water, which in November was 105° F., while the air was 72° F., and so strongly impregnated with sulphur that the stones have been changed into a dark-green colour. For curing cutaneous diseases this water is considered very efficacious. The pits consist of about twenty jets of vapour of various sizes, from not larger than the steam from an over-boiling tea-kettle, to columns rising high in the air with great force and deafening noise. As this sulphurous vapour ascends and comes in contact with the air, it condenses in the form of a fine yellow powder, known as the flowers of sulphur, and which accumulates in large quantities around the mouth of the pits. Some of these jets seem to have blown off their encrustment of earth, and are now left in the shape of a natural caldron of boiling lava, which, on overflowing and cooling, covers the rocks and stones with a crust, under which is found a compact mass of sulphur of a soft granular crystalline texture. Clear springs of boiling water are found in every

lake, strongly infused with sulphur. At present the mines are not worked, but formerly many tons were exported.

Opposite Mêng-Ka, as I have before stated, the river branches off to the s.s.w., leading to *Su-ko-y-ing* and *To-ko-kam*. It is not navigable beyond the latter town, owing to numerous rapids and the presence of savages. The entrance to the *To-ko-kam* river (as we called it) runs through a rich alluvial plain, highly cultivated with rice, peas, sugar, and hemp. Its banks at the mouth are about 1000 yards apart, and from their height one is led to infer that formerly a river of considerable magnitude existed, whereas at present it is only a wide but shallow sheet of water, most tedious and troublesome to navigate, owing to the number of banks and circuitous channel. On the left bank, some 5 miles up, is situated the magisterial town of *Sin Ching*, where conveyances are generally engaged by travellers to *Tuk Cham*. After some miles of the most tedious navigation in the shallowest water imaginable, we were introduced to the rapids, the characteristic feature of Formosan rivers, and found them more formidable on this river than on the Ko-lung, or, as we called the other to the southward, "Henries River." As the traveller ascends the stream, the mountains show less and less signs of cultivation, and are more thickly wooded with firs, bamboos, and tropical plants of magnificent verdure. The bottom of this clear river is formed of boulders the size of a 68-pound shot, thousands of tons being scattered on each side of the river, indicating plainly its former breadth. The sandy soil appears to have been washed away from these boulders towards the junction at *Sin Ching*, where it has accumulated into the form of sand-banks. The river maintains a tolerably equal breadth throughout, that is, above the first rapid. A wooden and stone embankment has been erected to check the encroachment of the water on the cultivated ground, where it is inclined to eat away the banks, to prevent which in many places frames of bamboo filled with boulders are piled along the shores. Many of the rapids on this river are so shallow, but swift, that the boatmen are obliged to erect dams, made by putting large stones into bamboo frames and laying them in the stream to deepen the channel, by narrowing the surface of the water. Towards the head of the river it becomes an unbroken chain of rapids, which appears to defy ascent; yet the industry of the Chinese is sufficient to overcome these impediments of nature, and turbulent streams are made into navigable rivers. The very light draught of the rapid-boats enables them to sail up with a strong breeze, but seldom without the aid of a pole or boat-hook. Not far from *To-ko-kam* the river runs at the foot of a range of mountains some 1000 feet high, where large herds of water-buffalo were feasting on the rich pasture.

Having reached a hamlet at dusk where several boats had anchored, we also came to a halt, it being too difficult to ascend the rapids by dark. The next day we got our small boat and proceeded to the town of *To-ko-kam*, which is situated on a high bluff close to the river, and almost obscured from view by trees. This town defines the limits of Chinese occupied territory, beyond which neither Chinese or aborigines venture to cross, except the former when in search of camphor-wood, in which case a picket of rangers generally escort the wood-cutters to protect them from the savages. The *To-ko-kam* river may be considered as the branch supplying the most water to the Tamsui river. After rain the volume of water is so great and swift that no boats, it is said, can stem the current.

The fall from *To-ko-kam* to the last rapid we estimated at about 150 feet.

Many of the rapids are on such an incline that, to a person looking from his boat above the rapid at others ascending, all but the latter's sail is lost to view.

The line of demarcation between Chinese and savage territory is most striking in this vicinity. To the westward, richly cultivated table-land, with

sung little farms scattered over it, extends to the sea, while on the east, black and impenetrable forests clothe the lofty mountains, affording a good idea of the difficulty, danger, and labour it must have cost to expel the savages from their mountain fastnesses.

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3. *A Trip to Kalgan in the Autumn of* 1868. By R. Swinhoe, H.B.M. Consul, Amoy.

(Communicated by the Foreign Office.)

"Sir, "Takow, Formosa, Jan. 18, 1869.

"On the pleasure trip to Kalgan I made in company with Messrs. Ford and Carles, Student Interpreters, towards the end of September last, before leaving Pekin, I took some notes, which may be of importance in connexion with my present mission, on inland residence and navigation.

"The route we took was through the Tihshing Gate past Tsingho, Shaho, and Changping-Chow to Nankow, a village at the foot of the pass. The road through the pass is so fearfully bad that we were obliged to send our carts, though empty, each in charge of an extra man, and our baggage on donkeys. The pass is about 13 miles long, winding through the hills until the gate of the Great Wall is reached, issuing from which another rough couple of miles brings you to Shato, a small walled village, consisting mainly of inns, and supported by the passenger-traffic of the pass. Donkeys and mules are procurable at Shato, as at Nankow, to help passengers through the terrible pass. Along the pass one notes the remains of a paved way in places; but the greater part of it has long since worn away, and the stones have been forced right and left, leaving a very rough and irregular road, unfit for any wheeled conveyance, and I doubt if any but the strong springless Pekin carts could endure without destruction the jolts and tumbles as they are half-carried half-dragged over the big stones that lie about. A mule-litter is doubtless the easiest, quickest and safest mode of conveyance over the stony region which is traversed on the way to Kalgan. The Ken-yung-kwan, or walled barrier, that is gone through in the pass, is of some interest for the fine old arch that spans the road through it. The inside of this archway, besides the figures in bas-relief it bears, is inscribed with a Sanscrit prayer, represented phonetically in four modes of writing, viz., Sanscrit, Chinese, the Newchi character, and the Passepa. The Newchi inscription is the only inscription of that quaint character now accessible to students. This character was invented by a scholar under the order of Taetsoo, the first Emperor of the Kin dynasty during the twelfth century. The Newchi were a tribe of Tartars from the mountain-wilds north-east of China, who ruled in China as the Kin dynasty (see Article VIII., by Mr. Wylie, in 'Transactions of China Branch of Asiatic Society, Hongkong,' Part vii., p. 137, 1859). The Passepa was an alphabet invented by Pashpa, the first of the hierarchy of Dalai Lamas in the Yuen dynasty. A specimen of this writing also occurs in a temple at Shanghae (see Mr. Wylie, Art. III., 'Transactions of the China Branch of the Royal Asiatic Society, Hongkong,' Part v., 1855). At the first gate of the Ken-yung-kwan there is a barrier for the collection of duties. Inside the further gate the Yamên of the Military Commandant (Tooszo) is situated. A wall runs up the hill on each side of the first gate and descends to meet the further gate, thus encircling the barrier town. The Great Wall at the head of the pass is in tolerable condition, and evidently more modern than the wall at Kalgan. Its gate is in ruins and deserted. The country about and beyond Shato is barren and bare, with little cultivation (chiefly of sorghum), and the roads rough and stony as far as Yulin. As you approach Hwailai Hsien, 50 li from Shato, these improve, a small river runs past this town, by the side of which we saw a large herd of camels laden with teas for Russia. The road takes you over

a good stone bridge through the town, which is poor and dilapidated, but surrounded by an imposing wall. Indeed, almost every village on this route has a high wall, either of brick or mud, encircling it. The market was well stocked with fruit and vegetables. Fifty li onwards brings the traveller to Shaching, passing on the road Too-muh-pao, a village with a high mud wall crenellated along the top with brick. Shaching, or more properly Shanching (three cities), is so called from the fact of its consisting of three walled enclosures lying contiguous. It is under the jurisdiction of the Hwai lai Hsien, and controlled by a Seun Keen residing in the central enclosure. It is a somewhat flourishing place, and contains certainly the best inns I have met with in North China. Pao an Hien, a walled town of no great pretensions, is passed after 20 li, and 20 li further brings us to the walled town of Kemeih, which affords in its outward suburb two very tolerable inns. The Wenho (river) appears on the left, winding southwards, and the plain shows more cultivation. To the north-east of Kemeih stands an imposing hill, with a temple on the top of it. Coal outcrops on the sides of the hill, and we noticed several deserted mines; some, however, are still worked, and the fuel taken to Seuenhwafoo and Kalgan. The hills on the left side now approach the coal-hill range, and form a gorge for the Wenho to pass through, the road passing on the right, cut in many places through the hard rock and very rough. Leaving the gorge, an undulating country is crossed till Heang-shuy-poo is reached, 70 li from Shaching; 30 more li, some of them over very rough hilly road, brings us to Seuenhwafoo, the capital of the whole country between Shato and Kalgan. Here we met Mongols with large herds of horses and camels carrying in big blocks of paichien, or white lead, from Mongolia. This city was large and walled, but we saw it under unfavourable circumstances; the rain had fallen so heavily that the streets were all under water. A Roman Catholic Mission is established here, and is apparently in a flourishing state. Sixty li more brought us to Kalgan or Chang-chia-kow. The total distance from Peking to Kalgan is about 120 miles. Kalgan consists of two towns, the Hiapoo and the Shangpoo. In the Hiapoo is the walled town of Wantsenen Hien, approached by a good modern bridge, the Tungkéao. The road leads past the town to the Shangfoo, about ¾ mile distant, at the end of the busy main street of which in a short pass is the gate, and up the hills on either side run the ruined remains of the old Great Wall. Wantsenen Hien, with its mosques and minarets, has a very Oriental appearance. Its main streets were crowded, as were those of the Shangpoo, and there seemed to be much traffic. Two American missionary families reside in the Shangpoo or Upper Kalgan, but no Roman Catholics are established there yet. Snow lay on the hill-range on the left, and it felt cold: yet apples, grapes, and other fruits and vegetables, continued in abundance; and on our journey to and fro we constantly met large droves of donkeys and mules loaded with baskets of fresh fruit on their way to the nearest market. Our innkeeper conducted us through the gate to the stony gully which is divided by a hill-range; the road to Mongolia, such as it is, passing on both sides. The plain at the head of the gully was said to be 100 li distant. On the left side of the right-hand road stands a Confucian temple, well carved and painted, most of the pictures representing foreign life and foreigners making presents to Chinese grandees. The foreigners in these pictures were, of course, Russians; they know of no other kweitze (or imps) in Kalgan.

"Russian cloth is the only broadcloth found in the shops at Kalgan and Seuenhwafoo. Drills and opium are brought from Tien-tsin, and represent our trade in these markets. Camels loaded with tea-chests, carrying little white flags marked with Russian letters and Chinese characters, were passing through Kalgan in large numbers. The Russians have an establishment about a mile beyond the gate, at which six Russians reside. One of them keeps an hotel for the accommodation of European travellers. One-fifth of the merchandise

imported *viâ* Kiachta, consisting mainly of cloth and raw leather, the Russian merchants are allowed to detain for disposal at Kalgan, which appears to be a large centre of distribution. The duties on this portion are collected at Kalgan. The remaining four-fifths of the goods pass on to Tien-tsin, and pay there. When the goods are once sold at Kalgan they cannot be repurchased, as no trade is sanctioned there. On one occasion, however, this was managed privately in the case of leather; and an endeavour was made to break through the rule generally, but without success. The chief export trade to Russia is of course, tea. Russian tea-tasters are said to reside on the tea-hills near Hankow, and to make their own selections from the teas there grown. The tea they purchase is packed and sent by steam to Shanghae, whence it is forwarded, also by steam, to Tien-tsin, where every chest is certificated by the Russian Consul. The Russian tea is the largest item of freight that the steamers carry from Shanghae to Tien-tsin. From Tien-tsin the tea is forwarded to Tungchow in barges, where the resident Russian merchants pack it on the backs of camels, and send it on by direct route (without passing through Pekin) to Kalgan. The resident Russians at the last-named place thence pass it on to Kiachta across the Mongolian desert.

"It will thus appear that the Russian merchants reside and do some sort of business at these places, where we have not asserted our claim to reside. They work in companies, and by means of their own Russian interpreters; their business seems to progress without ruffle or disturbance. We might, perhaps, with advantage claim the same privileges for our merchants; though, from what we learn from the failures at Tient-sin in the competition with the Chinese merchants, there is no reason to hope that our people would be more successful at Tungchow and Kalgan than they have been at Tient-sin. The Russians have the transport business, which is their great standing, failing all other trade. Our trade would simply be general, and would have to struggle against Chinese competition; and, as the expenses of Chinese establishments and of Chinese mode of transport must inevitably be less than those of our people, the British merchant would gain little advantage by such privilege to trade. The right of residence in the Hankow tea-hills, I must leave till I visit that neighbourhood.

"Mr. Mongan, Her Majesty's Consul at Tien-tsin, in his report on inland residence and navigation, writes with regard to Kalgan or Chang-chia Kŏw: 'Were British subjects allowed to reside at Chang-chia Kŏw, the pass by which the trade from Tien-tsin flows into Western Mongolia, and finds its way to the great marts of Lama miao and Kwaihwa-ching, they might teach the Mongolians how to improve their breed of sheep and prepare the wool for exportation with a result that would benefit both teachers and pupils, and tend to increase, in no small degree, the value of the export trade from Tien-tsin.'"

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4. *On the Failure of Earthquake Predictions in Peru.* By the Hon. W. G. S. Jerningham, Chargé d'affaires at Peru.

(Communicated by the Foreign Office.)

"My Lord, "British Legation, Lima, 12th October, 1869.

"The great apprehensions which, it would appear, the inhabitants of South America, from Panama even to Ancud in Chili, have been labouring under, that earthquakes were to happen in these regions of the earth on the 30th of September or 1st of October, in consequence of a belief in the theory of a German astronomer, M. Falb, who, in a pamphlet which was translated into Spanish and published, called the attention of the inhabitants of those countries which are the most exposed to earthquakes, viz., equatorial regions,

and particularly Peru and the West Indies, respecting the danger menacing them, have happily subsided without any disaster having occurred anywhere in the territories this side of the Andes.

"On the 27th September, in Lima, a very slight movement of the earth was experienced, and on October 3rd another about quarter-past 12 A.M., with some noise; but on the 30th of September, 'the much dreaded day,' and the 1st of October, this part of the earth seems to have remained particularly quiescent, and even at Arequipa, where terrestrial movements have been more or less the order of the day since the 13th August last year, the recent 'dangerous period,' that has excited such general alarm, passed by without any 'temblores,'—on the contrary, it has been remarked that the last fifteen days there were the most tranquil they have experienced since the cataclysm of the memorable 13th of August, 1868.

"At Arica and Tacna, places that were visited in August this year with a good shaking, nothing happened, and Iquique, where the inhabitants were in a great state of anxiety, has neither felt an earthquake nor been washed again by a tidal wave. On the 5th October, the day on which the moon was said to have been nearest the earth, high tides and sea-invasions were expected, and at Callao a great many of the inhabitants had previously left the place and retired to Bella Vista and other places. But as the sea presented no great change, and no cataclysm has happened, people have returned to their dwellings, and trade and work have recommenced to recover the time lost by these general apprehensions.

"After what has happened many times in Peru, Chili, and Ecuador, since the discovery of these countries, and the terrible commotion last year in various parts of them, it is no wonder the inhabitants become alarmed when astronomers and scientific men attempt to warn them of the advent of possible catastrophes."

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Issued June 7th, 1870.]

SESSION 1869-70.

Fourth Meeting, 10th January, 1870.

Sir RODERICK I. MURCHISON, Bart., K.C.B., President, in the Chair.

Presentations.—*J. V. Shaw, Esq.; J. K. Laughton, Esq.; James Reiss, Esq.*

Elections.—*William Bragge, Esq., C.E.; Joseph Benjamin, Esq.; Andrew H. Black, Esq.; William H. Bowyer, Esq.; Rev. David Charles, M.A.; Bernard Cracroft, Esq.; John Corrie, Esq.; Robert Clark, Esq.; Captain John C. Howeson, R.N.; Charles W. C. Hutton, Esq.; William Vaughan Murray, Esq., M.R.I., &c.; William Nicholas, Esq.; Robert Oldham, Esq.; Henry Oldham, Esq., M.D.; Robert Shaw, Esq.; James Wiseman, Esq.*

Accessions to the Library from December 13th, 1869, to January 10th, 1870.—A Collection of Tracts on Emigration. By various authors. Donor, J. Bate, Esq. 'State Emigration.' By E. Jenkins. Donor, the author. 'Transplantation, the True System of Emigration.' By F. Young. 'The Great West.' By E. H. Hall. Donor, the author. 'Passeggiate nelle Canavese.' By A. Bertolotti. Donor, the author. 'Handbook of Physical Geography.' By Keith Johnston. Donors, the Publishers. 'Coniferæ.' By R. Brown. Donor, the author. 'The Climate and Resources of Madeira.' By J. Grabham. Donor, the author. 'Neue Beiträge über Brasilien und la Plata.' By J. J. Sturz. Donor, the author. 'Die Deutsche Auswanderung.' By J. J. Sturz. Donor, the author. 'The Rob Roy on the Jordan.' By J. Macgregor. Donor, the author.

ACCESSIONS TO MAP-ROOM SINCE THE LAST MEETING OF DECEMBER 13TH, 1869.—A Map of the North-West part of North America ceded to the United States by Russia, and now called Alaska. Presented by A. Petermann. A Map of Western Australia, showing the discoveries of J. Forrest. Presented by A. Petermann. Isthmus of Suez—on two sheets. Presented by J. Wyld, F.R.G.S. Several copies for distribution. Map of the Railways around London. By M. Vigers. Presented by the author.

The business of the evening was the reception of the Report of the Society's envoy, Lord Houghton, concerning his visit to the opening of the Suez Canal. In introducing his Lordship, the President thus addressed the Meeting:—

"GENTLEMEN,—When preparations were being made to inaugurate the opening of the Suez Canal, the enlightened Ruler of Egypt, who is one of our Honorary Members, did me the honour of inviting me through his Minister, Nubar Pasha, to attend that grand and most important international ceremony.

"Feeling unable, from the uncertain state of my health, to avail myself of this great privilege, I deemed it to be incumbent on me to have the Royal Geographical Society well represented. For, independently of congratulations on the accomplishment of so vast an undertaking, I felt most anxious to testify to the Khedive the deep sense of my associates and myself of the great services he was about to render to geographical science by the confidence His Highness reposed in our friend Sir Samuel Baker, and the liberality and generosity with which he had enabled that successful traveller to endeavour to open out and make known to us the true physical geography of large portions of Inner Africa, which, notwithstanding the efforts of Livingstone, Burton, Speke, Grant, Baker, and others, still remained undefined.

"I therefore induced my friend Lord Houghton, who, as one of the Trustees, is a permanent Member of the Council, to undertake this duty and act as the representative of our body, which he did with cordiality; and I doubt not, that with his well-known eloquence, his Lordship has conveyed to the Ruler of Egypt a full recognition of our obligations to His Highness, accompanied with our hearty wish for the success of his great international enterprise. I now call on Lord Houghton to address the Meeting."

Lord HOUGHTON spoke as follows:—"When the proposal was made to me that, as Trustee of the Royal Geographical Society, it would be convenient and appropriate that I should go to this great festivity to represent that distinguished Corporation, I, being no wise unwilling, and not prevented by any accidental circumstance, thought it my duty to do so. I proceeded, as no doubt many other persons did, under the good organisation of the Peninsular and Oriental Company, and I am bound to say that everything which that important Company did, both for the comfort of the passengers to Egypt and for the establishment of their own character in Egypt, was all that could be desired by this Society and by this country. When I was asked to give you an account of my visit, I felt that it was a very different question. If I had arrived in England immediately after the opening of the Suez Canal I have no doubt—I say it without diffidence—that,

from all the information I acquired, from all the advantages I had, I should have been able to give you a novel and somewhat interesting lecture; but after your thirst for information has been satiated by the ability of the correspondents of every newspaper both in France and in England, and your intelligence has been satisfied by the reports which have been made to the Admiralty and to the Royal Society on all the scientific points of the matter, I feel I should be doing a graceless task if I were now to inflict upon you an essay on the Suez Canal. You have read so much upon the subject, you know it so well yourselves, that it is only in deference, in loyalty I may say, to our excellent President, that I appear here to-day to offer you a few desultory remarks upon any matters which it seems to me have not been sufficiently brought forward or prominently stated in the public journals, added to any little matter of private experience which I think may entertain you.

"Now, what is this Canal through the Isthmus of Suez? After having read so much about it, having heard so much about it, having seen the thing stated in moderate language in English journals, in immoderate language in French journals, I am inclined to think that its geographical, its commercial, and its political importance have been somewhat overstated. I have seen it compared to the discovery of America, in fact I have seen it placed above the discovery of America, because it has been said that to unite two worlds was a finer thing than to discover one. I cannot agree with that sentiment, nor do I think that its consequences can even be compared to those of the circumnavigation of the Cape by the great Portuguese navigator. Nevertheless it has its historical value, and I think we are doing it rather an injury than a benefit by exaggerating its importance. It is impossible to look at the map suspended on the wall of this room, to think of the relations between those two countries—two worlds—and, above all, to consider what was the power, the magnitude, the intellectual worth of ancient Egypt, without feeling that if it had been the desire of any generation previous to our own to make that Canal, it would have been made. I always think that upon the question of invention we are much inclined to forget that there are two parties in the case, the inventor and those for whom a thing is invented. With regard to the most remarkable invention in the history of the world, that of printing, we see that the impression of certain blocks went on for generation after generation, and we may well believe that the small change from fixed to movable types must have suggested itself to various minds in different countries, and yet the invention did not occur until that par-

ticular moment when movable types were wanted, when people wanted to read books. We see the same thing in medical science. We know that anæsthetics were discovered in the 13th century in Italy: for some forty or fifty years all the advantages we now derive from chloroform were enjoyed by the people of Florence, and yet that knowledge was allowed to expire through the superstition and the unfitness of the people to comprehend the invention. Thus the Suez Canal is really the product of the wants and desires of our own times, which can appreciate and apply its utility. The communication between the Red Sea and the Mediterranean might have been made just as easily as the great works of irrigation that have been made in Egypt through all the ages of the Pharaohs down to the times of the Ptolemies. That people, most apt for mechanical purposes, capable of an amount of human labour that could raise the Pyramids, do not you think, if it had been desirable, that they could have made the Canal? But the inhospitality of those days, and their abhorrence of free commerce, made it impossible for any authority to wish for such an intrusion into the Kingdom of Egypt as would have been produced by a Suez Canal. It was nobody's interest to divide Africa from Asia. Any Egyptian governor from the time of the Pharaohs, through the Romans and almost down to our time, would have believed that such a section of Egypt as has been produced by this present Canal would have caused not only an unjustifiable and unnecessary invasion of foreigners into their country, but the destruction of the nationality and integrity of Egypt. All the canals which were made in those times were communications between the Nile and the Red Sea, and not attempts to any extent, as far as we can the least discover, to make free communication between the Red Sea and the Mediterranean. Therefore I believe that it is not the difficulty of the work, or in any degree the peculiarity of the work, which has deferred it to so late a period; but that in the fulness of time, when that work has become commodious and advantageous for the interests of the world, it has been perfected.

"The present circumstances under which the work has been accomplished are these. The French tell you that Napoleon I. was the author of the Suez Canal. Of course it is probable that they should say Napoleon I. was the author of anything great, and I have no doubt that through the mind of that wonderful man this notion passed, like a myriad other notions, some of which remained, while others flitted away. But the credit, as far as France is concerned, of the Suez Canal, is mainly due to a very peculiar man, of the name of Enfantin, who combined, to an extent which

we Englishmen can, perhaps, hardly conceive, an extravagance of social speculation with a great amount of practical sagacity. He was the father and founder of the Saint-Simonian religion. When, in 1833, Père Enfantin came out of prison, into which he had been cast for some infraction of the laws of his time, he went to Egypt, and took with him several persons of his own peculiar sect, who were devoted to him, and to whom he confided that the great object of his life was a Canal between the Red Sea and the Mediterranean. He found in Egypt at that time a Vice-Consul of the name of M. Ferdinand Lesseps, whom he interested in the work. He found also in Mahomet Ali, the Governor of Egypt, a most original and vigorous man, who received with very great willingness all the notions of Enfantin respecting the Suez Canal. But at that time Mahomet Ali had another project in his head, which was the great Barrage of the Nile; and for several months it remained quite uncertain to which great work he would give his, so to say, royal patronage. At last, unfortunately for M. Enfantin, it was decided in favour of the Barrage. Nevertheless, he remained in Egypt for some time, and made inquiries as to the possibility of the enterprise. He took surveys of a very interesting character, and after three years, during which time a great number of his friends had been cut off by the plague, he returned to Europe. Very little more was heard about this enterprise until the year 1845, when, as you know, there was a great commercial excitement in Europe about railways and intercommunication of all kinds. At that time he started the project, and in 1846 established in France the *Société d'études du Canal de Suez*,—a society of persons who were to study the practicability of making this canal. Looking over the names of the persons who composed this Society, one of the first I find is that of Mr. Robert Stephenson, the English engineer. Soon after came the revolution of 1848, and the commercial difficulties connected with it; but, when affairs were at all quiet in France, Père Enfantin was again at his work, and, taking advantage of a mission of M. de Lesseps to Said Pasha in 1854, he organised a series of inquiries into the best methods of making this canal, and one of the chief personages connected with those inquiries was Mr. Robert Stephenson.

Now, having gone through the Canal of Suez, I have at least learnt one lesson—not to go out of my depth; and, therefore, upon all engineering and purely scientific matters I shall be either entirely silent, or request any persons who are here who understand them much better—some of whom have been my fellow-travellers—to state their opinions; but I may say this, that the result of the inquiries of Mr. Robert Stephenson, and those who were with him,

was entirely unfavourable to the enterprise of the Suez Canal. That impression Mr. Robert Stephenson brought to England, and at the same time brought before the public in the strongest manner the advantage of having a railroad through Egypt, and threw himself with great energy into the project. That railroad was in a short time completed. Now, the railroad between Alexandria and Suez having been made, you will quite see that a great many of the approximate advantages of the canal would almost disappear. We had almost as rapid and good a communication as we could wish to have, and therefore the public interest and public excitement in the canal was very much diminished by the mere fact of our having an efficient railroad; so that when M. de Lesseps, notwithstanding the discouragement of Mr. Robert Stephenson's unfavourable report and the coincident opinion of many of the leading engineers of Europe, undertook that work—the system of Egyptian railroads being already made, or in making—we must all of us own that there must have been an admirable energy in the mind of that man.

"M. de Lesseps has not invented the Suez Canal. It is the result of the thoughts, the deductions of many other men, but he is, as it were, the complement of them all.

"Now I will pass from this point to the personal circumstances under which I found myself, as the representative of the Royal Geographical Society, at Port Said some two months ago. We went from Europe to Egypt a small body, as far as the English were concerned, of the guests invited by the Khedive. I doubt whether there were fifty, of all who had been invited; I doubt whether fifty more English came who were not invited, so that, as far as England was concerned, we were sparsely but I think respectably represented. It was not the same with the nations of the Continent. France took her full advantage, and from the mere fact of this matter having been in so great degree a French enterprise, I do not say it was any way unjust that she should have done so. The English element was mainly composed of representatives of important Societies; though some—for instance, the British Museum—did not choose to be represented, and would not—I never understood why—allow its representatives to go. The Royal Society was represented most fitly by Mr. Bateman, the well-known engineer, who delivered, only a few days ago, an interesting lecture upon this subject before the Royal Society. There were also correspondents, some men of high literary pretensions, representing the principal English Journals. But the French and the Germans came in large bodies, and we English were merged in the multitude.

In fact, it was a great Excursion-Train from Europe to Africa. That is the only fair description which can be given of it, and in an excursion train, you know, it is very difficult to distinguish anybody, so that on the whole I am rather glad that our excellent President did not go himself, but made me his substitute. For, what with that lovely and enterprising lady the Empress of the French, with the Emperor of Austria, who charmed everybody by the simplicity of his demeanour and the intelligent interest he took in all matters connected with the canal, with our own connection the Crown Prince of Prussia, and a great many other royalties, I could not help feeling that even our illustrious President might have been submitted to the ordinary confusion and discomforts of a crowd. Now there was the best intention on the part of the Egyptian Government. The magnificence of the entertainments, and the amount of money that was spent was something fabulous, and, whatever failed, everybody felt that any inconveniences they were put to really came from the accidents, the inevitable circumstances, and in no way whatever from the complicity of the Government by which they were entertained. There was one unfortunate event, of which I have no difficulty in speaking, because it was one of which Nubar Pasha, the Foreign Minister of the Khedive,—a most gracious and intelligent gentleman, for whom everybody, who is acquainted with him, has the greatest esteem,—went to the extravagant length of saying, 'You may forgive me for this blunder, but I never can forgive myself.' It seems to me that he was not in the least guilty. The circumstance was this. I mentioned that I went to Alexandria under the guidance of the Peninsular and Oriental Company. But at Alexandria the guests were placed in large and luxurious Egyptian steamers, many of them the private yachts of the Khedive, and conveyed to Port Said for the purpose of being taken through the Suez Canal. At Port Said the ceremonies connected with the opening were of the greatest interest. It was there took place that religious function of which you have seen so many reports, where the Moslem priests in a simple and noble manner called for the benediction of God upon this great enterprise. That was followed by a ceremonial performed with all the pomp of the Romish worship, and a dignified discourse by a French prelate. On the evening of that day M. de Lesseps came to Nubar Pasha and told him that, to his great grief, he had come to the conclusion that none of the large Egyptian vessels could securely pass through the canal. Now these large Egyptian vessels contained all the guests of the Pasha, and therefore what was to become of them? Such as could find any private

refuge did so; the rest were put into smaller vessels and taken to Ismailia, where they were placed in tents, and taken care of until their return to Cairo. I have never been able to explain to myself why this resolution was taken so late. It produced an enormous amount of individual discomfort, and, so far as I could see, there was no reason whatever why the same resolution should not have been come to some days before, and arrangements made accordingly. As it was, that was the one great inconvenience to which the guests of the Pasha were submitted. When they were at Ismailia they found comfort, almost luxury. For my own part, and on the part of those who were with me, I can only say that we found perfect hospitality in the English vessels which were there. Lord Dudley and his party went on board Mr. Talbot's yacht the *Lynx*, and I was kindly received by Mr. Elliot and Mr. Pender in the *Hawk*, which had been purchased by the latter enterprising pioneer of commercial intercourse, for the purposes of the Electric Telegraph Maintenance Company, and in which I had the very great advantage of going through the canal in the company of Mr. Hawkshaw and Mr. Bateman, the two illustrious engineers.

"At Port Said I saw M. de Lesseps. The only connection I remembered between the Royal Geographical Society and the Suez Canal was the lecture of Captain Pim, which was delivered on the 11th April, 1859, and the effect of which was to bring to bear, both in the lecture itself and in the discussion which followed, the impression upon the Society of the impracticability of the Suez Canal. Therefore I was not sorry that M. de Lesseps recognised me as an individual and not purely as the representative of this Society, and I was somewhat flattered when he came up to me and said, 'I remember you; you were one of our English friends when our friends were few.' I then recalled to mind that at the time M. de Lesseps had come here, and had been somewhat ill received by the commercial classes and the political opinion of this country, I expressed to him my full belief that he would succeed in his enterprise.

"Here perhaps you will allow me to say a word for a friend of mine who is now passed away, and whose opposition to the Suez Canal has been made a subject of much criticism, even of censure—I allude to Lord Palmerston. I first met M. de Lesseps at Lord Palmerston's house, and at the time a great illwill was excited in certain circles in France by the notion that Lord Palmerston had exercised an almost undue political influence in opposing the Suez Canal. There were persons, however, and among others myself, who ven-

tured to differ from Lord Palmerston, and I thought it was perfectly useless whether we opposed the Suez Canal or not, for that the French were determined to make it, and that if the French and the Egyptian Governments were once agreed, the canal would be made, whether we liked it or no. But there is a point which I should be very glad to see put upon record, which is, that the project which Lord Palmerston opposed was not the project which has now been carried out. The project to which Lord Palmerston gave his political opposition was the arrangement between M. de Lesseps and Said Pasha, the effect of which would have been to transfer to a French Company, and through that French Company at any time to the French Government, the possession of a large province of Egypt which was to be irrigated by a fresh-water canal in conjunction with that across the Isthmus. Lord Palmerston took the ground that it was not necessary for the purposes of the ship-canal, nor in any degree a necessary part of the commercial enterprise, that a French Company should possess a whole province of Egypt. That representation was made by Lord Palmerston so distinctly and so powerfully at Constantinople, that a new arrangement was entered into of a totally different nature. Compensation was given to the Company by the Pasha for the possession of the land, and therefore at this present moment the Company only possess the canal itself, and certain portions of the banks connected with it, which, considering the sacrifices they have made, I am bound to say they are fully entitled to. I must admit that Lord Palmerston's political opposition to the Suez Canal was hardly in consonance with the general moderation of his policy, because it was one of those events which, as I have already stated, I believed would come about naturally in the fulness of time under any political circumstances whatever.

"Well, so we started from Port Said. A striking moment it was, and to my mind on looking back to my impressions, it is the grandest of the whole. I see here persons who were present with me at that moment, and I think I might appeal to them whether the entrance of that quiet and solemn procession of ships into the desert, in that beautiful bright Egyptian morning, was not a spectacle they can hardly forget? After the cannons, the fireworks, and all the tumult of the preceding day, there they went on, vessel after vessel, at no great distance from one another, each watching the preceding one with the intensest interest, with the knowledge that any one might stop the way and so break all the charm. And so the whole of that day we traversed the silent desert. I do not know whether it was done on purpose, with that sense of art

which the French so curiously exemplify in all their great manifestations, but every sign of life seemed to be withdrawn from the banks. There was not a dwelling, there was hardly a wandering Arab. In this place, which had been the sepulchre of so many lives—which had been the hive of humanity for the last ten years—there was a perfect, desolate, stillness. On went the vessels through the marsh, through the sand, as it were new animals invading that solitude till we arrived at Lake Timseh. I told you I had the advantage of accompanying Mr. Bateman and Mr. Hawkshaw, and therefore I may say that I got to know the canal thoroughly well, because we sounded every step that we went along, and through the whole of those three days we never—as far as I remember—sounded less than 18 feet.

"When Mr. Hawkshaw landed at Port Said, M. de Lesseps took him by the hand and presented him to all the engineers who were about him, and said, 'This is the gentleman to whom I owe the canal.' And it was literally true. At the time when the reputation of the canal was at its worst—when public opinion in Europe was growing against it—when money was the hardest to get—the Khedive asked for an English engineer who would give him a final opinion as to the practicability of the canal. He selected Mr. Hawkshaw, who is a man not only high in his profession, but of the most singular independence and simplicity of character—a man who fears nobody and nothing in the cause of scientific truth. The Khedive told Mr. Hawkshaw that if he would report to him confidentially that the canal was impracticable, he would take care that the works were brought to an end without injury to anybody. You have had before you the report of Mr. Hawkshaw. He reported that the canal was not only feasible, not only practicable, but that to his mind the main engineering difficulties which had been raised were not such in any degree as would authorise its abandonment; that he believed the canal could be made and could be maintained at a moderate and reasonable expense, and therefore, when M. de Lesseps presented Mr. Hawkshaw, as I saw him do, to the persons present at Port Said, he was thoroughly justified in saying, 'It is to him that I mainly owe the accomplishment of this great enterprise.'

"What happened at Ismailia when we arrived there you all know very well. You have read over and over again the accounts of the festivities, and the fireworks, and the oceans of champagne, and the acres of *galantine*, and all the profuse hospitalities which we received. It is the simple fact that there must have been present in that wild locality at least 5000 Europeans, and at least 10,000 Orientals. Everybody had more to eat and drink than they could

consume, there was glorious weather, and if everybody was not contented it was entirely their own fault.

"On looking back over the records of the engineering of the passage from Ismailia to the Red Sea, you will see that Mr. Robert Stephenson and other objectors found the chief difficulties in that part of the canal. Now, when proceeding through the first portion from Port Said to Ismailia it was evident that the banks were very friable, that from the impossibility of bringing in fresh water to bear, it was extremely difficult to produce any vegetation sufficient to consolidate them, and thus that there might be considerable difficulty in keeping it open or enlarging it; but at the same time I am bound to say that, though a strong wind was blowing the whole time, I was not conscious of the presence of any large amount of sand of any kind, or of any material which could encumber the canal. There were certainly some curves which were awkward for long vessels to pass, and which will, I have no doubt, if the canal attains its perfection, be shortened. But from Ismailia to the Red Sea, there did not seem to be, either between Ismailia and the Bitter Lakes, or between the Bitter Lakes and the Red Sea, as far as I could see, any embarrassment whatever. Yet this range included the ancient Serapeum, and here is a specimen of the rock which had cropped up almost unknown to the engineers in the middle of the canal, and for the reduction of which great labour was required up to the very last moment in which we passed it. Still, as far as I know, and I have looked out for information to the contrary, no one vessel found the slightest difficulty in passing the Serapeum, or even scraped the rock. Of course, with the engineering powers that are employed in blasting the rocks at the bottom of the canal, there is no reason why this one should not be reduced a certain amount every day, and to any given amount in a certain number of months.

"As to the future of the canal itself, the widening of it or the deepening of it, the case is simply this, that a single line of rails has been laid down, which may be made by a certain amount of expenditure a double line any time you choose. I know it was the expressed opinion of Mr. Hawkshaw that it would not be advisable to make the canal too large. He said, if you made a canal larger than was required for two vessels to pass one another, then they would wander and get foul of one another, and there would be more danger than in a comparatively narrow canal. All that was wanted was a canal sufficiently wide for two vessels to pass. At the present moment it is not wide enough for two large vessels to pass at certain points, and that will require to be remedied. The deep-

ening and the enlarging of the canal are matters solely of expense, and I heard it said by what I consider the best authorities, that about 2,000,000*l.* sterling would be sufficient to render the canal perfectly effective for all purposes of commercial navigation.

"You asked me, sir, to state something with regard to my presentation to the Khedive. I saw his Highness the first time at Ismailia, on board his own steam-yacht. I was introduced to him by our Ambassador, and I presented to him the compliments of this distinguished Society. I spoke of the interest we had taken in his work, and offered him our congratulations on its completion. His Highness was pleased to express his gratification and his thanks. At that moment his Highness was in a state of great excitement, because he had achieved, as he considered, a very great work, and he told us what it was. He said, 'Last night I had rather a hard time of it. I was very anxious, of course, that the *Aigle*, on board which was the Empress of the French, should have a perfectly free course, and so I sent a ship called the *Latiff* to clear the way. The *Latiff*, a very short time after having got into the canal, ran against the side of the canal, stopping it up altogether. The Captain of the *Latiff* sent to Port Said, and awoke me between 11 and 12 o'clock at night, upon which I got into my own little vessel and took 300 men with me, *Je faisais un peu le capitaine moi-même*, so that by 6 o'clock in the morning I had got the *Latiff* off, and soon had her shunted at one of the stations, and went on in my yacht so as to have the course clear for the *Aigle*, which was to start at 7 o'clock in the morning.' There seemed to me something very practical and interesting in the sovereign of the country himself not only leading, but clearing the way through his own canal. He told another person that if he could not have got the *Latiff* off he should certainly have blown her up, so that the *Aigle* might have got on clear. I am not quite sure that that feat would have been successful, but at any rate it showed the Viceroy's energy.

"Thus we passed through the Suez Canal, testing the enterprise as we went along, enabling me on the best authority to assure you that we believe that the work is completed. And a noble work it is. I do not say that its effects, its immediate effects at any rate, will be very considerable either on the political or the commercial arrangements of the world. The canal that follows a railway cannot do much. The railway has done the thing already. The canal cannot create, it can hardly extend communication; all it can do is to facilitate the trade that exists. At the present moment the canal is perfectly open to any trade in small vessels which can be taken through the canal and the difficult passages of the Red Sea up to

Aden by steam-tugs, and then left to take their free course to India, or anywhere else they like to go to. Now the whole question is, what commerce can be developed, and will be developed, by that project? There will, I believe, be a considerable amount of small trade with Italy, Greece, and the Levant. Whatever they can do has now, no doubt, a free and most advantageous opening. The Emperor of Austria, to whom I had the honour of being presented, said to me, 'Here I represent Trieste,' and there is no doubt that all that Austria can produce will be benefited by the canal. Italy is every day growing, as you know, in intelligence, in prosperity, and in independence; all that Italy can do will gain very largely by the canal. All that Greece can do, all that the Levant can do will gain also, just in proportion, and no more than in proportion to, the trade that they can produce and encourage—in proportion to their own exports and imports. I have no doubt that will gradually become a very important intercourse, though it will be gradual; but I believe that the canal will have but very little effect upon the great commerce of England and France. In the progress of time, as the canal becomes an established and recognised mode of communication, there will be considerable convenience in the conveyance of troops, and in the ordinary intercourse between England and Bombay; but nevertheless I cannot help feeling that for many years to come neither England nor France, which has sacrificed so much upon this matter, will be any considerable gainers. It is the small commerce which will gain first. The large commerce has its markets already. I should be very glad if gentlemen who are here, who can give us information upon these subjects, would enlarge upon what I have said, whether they agree with me or contradict me.

"We came to Cairo from Suez by the railroad, which, though ordinarily well-managed, was not equal to the emergency. The organization completely broke down, and we were too thankful to find ourselves at Shepherd's Hotel.

"I had the honour of paying a farewell visit to the Khedive, accompanied by Sir Samuel Baker. It may seem ungracious, but I was very sorry to see Sir Samuel Baker when I arrived at Cairo. I had hoped that by that time he was far on his way, and that the expectation which he expressed to me on leaving London in June —of eating his Christmas dinner on the great central lake of Africa—would have been realised. But, alas! it was very near that time when I left him still at Cairo. Since then he has left it, and started on his great work. Now I suppose there is no expedition which the Royal Geographical Society has more at heart than

this great one of Sir Samuel Baker, and, in concluding with a few words concerning it, I am sure I shall be speaking on a subject which interests you all. When Sir Samuel Baker left England he had an exaggerated belief as to the interest which not only the Khedive but the Egyptian Government took in his expedition. It had been represented to him that the expedition was the great object of the whole Egyptian people, and that he would be supported in every possible way in it. When he got there he found, as I believe most persons do find when they have to do with Oriental Governments, that the work which is the desire of the Sovereign is not only not always the desire of the people, but not always the desire of his own Government. Sir Samuel Baker found that he had only the Khedive to rely upon in the matter, and that neither the people nor the Government looked with favour on his expedition. You know that the suppression of the slave-trade is one of the main results which he anticipated from his enterprise. Now, the suppression of the slave-trade in those districts beyond Egypt would have a very peculiar effect upon Egypt itself. Slavery in Egypt is by no means the ordinary predial slavery of which we are accustomed to talk, but the system supplies domestics to the households of the Egyptian people, and therefore the notion of suppressing and arresting that form of slavery is by no means agreeable generally to the people of Egypt. But Sir Samuel Baker argued, I think very conclusively, 'As long as the slavery merely consists in bringing persons down to Egypt for life-labour, without violence, that is a matter with which I do not interfere; but as long as slavery implies that all those countries contiguous to the south of Egypt are to be kept in a state of the most abominable and cruel war, and are to be subject to continual raids, for the purpose of obtaining slaves for the Egyptian market, it is impossible that those peoples can be in a position in which civilization can be introduced, or in which productive agricultural industry can be established.' You will, then, understand that, in going to those countries for the purpose of putting down the slave-trade, although he goes with the full will and desire of the Khedive, the Egyptian people do not approve of the enterprise. He is, therefore, under circumstances of peculiar difficulty, and he told me to represent to you and to all his friends here that he hoped great allowances would be made for him if he came short of your expectations, and did not accomplish at once all that you desire him to do. The Khedive offers him everything, and is profuse in the men and the money that he gives him; but, nevertheless, he does not find that assistance in the populations which he expected. He told me he had hoped to

have gone beyond Gondokoro, and established the troops he has taken with him in a sort of military colony, for the purpose of bringing into cultivation a large portion of land between Gondokoro and the lakes during the winter, but that he feared very much that, by the time he got there, he should find the rivers so swollen as to make it impossible to proceed. At any rate, we may have perfect confidence in all that can be done by the chivalry and the intelligence of Sir Samuel Baker. He has with him that remarkable lady whom we have seen the grace and ornament of polite society, and of whom we can hardly comprehend the metamorphosis into the hardy companion and most useful associate of the adventurous explorer. He has now proceeded upon his work, and we must all wish him God speed. The embarrassments which have arisen with regard to the position which he occupies in relation to the Khedive and the Sultan have by this time, I hope, been arranged; in fact, so far as I could see, the diplomatic difficulties were of no gravity whatever. Whatever he does for the aggrandisement of Egypt, is also done for the aggrandisement of the dominions of the Sultan: whatever peoples he brings into subjection to, or connection with, the Egyptian Government will be, no doubt, subjects of the Sublime Porte. The Padishah reigns over all. The Pasha of Egypt is himself, and presumes and professes to be, nothing but the Viceroy of the Sultan. Therefore I do not understand how any umbrage can be caused by any distinctions being given to Sir Samuel Baker either by the one power or the other. All I ask with regard to Sir Samuel Baker is, that you will follow his proceedings with your usual interest, that you will make every allowance for him under the difficult circumstances in which he is placed, and that you will trust in him for the future from what you know of him in the past.

"I do not know that I have anything more to do than to thank you much for the kind attention which you have given me in these casual and incidental remarks; and if you have found anything in them which can have excited any interest or called forth any suggestions, I can only thank you for having added that gratification to those which I have derived from the expedition. There are gentlemen here who could enlarge or criticise these observations to your advantage, and you will permit me to say that I shall be only too glad if they will do so."

Sir FREDERICK ARROW said he believed the canal to be an unqualified success, a boon to humanity, and a great advantage to the commerce of the world. Looking at it with the eye of a practical seaman, he was sure that there were no difficulties connected with the enterprise which ordinary skill and care and proper appliances could not overcome. A good deal had been said, both before the opening of the canal and since, about the excessively sharp curves in some

parts of it, and about the great difficulty there would be in getting long ships past them. His impression was to the contrary, for he had watched long ships going around them. As they approached the difficulties they all seemed to vanish, and the truth was that the curves were not so very excessive. With ordinary care on the part of the helmsmen and those in control of the ship, there would be no difficulty in getting round any of them. It was quite true that in some places there were obstructions in the course of the canal; for while the greater part of it attained a maximum depth of twenty-six or twenty-seven feet of water, there were certain ridges, some of sand, some of rock, where the depth was only from eighteen to nineteen feet. There would, however, be no great difficulty in ultimately getting rid of those obstructions. He believed that in some places the depth was diminished by the filtration of water through the banks bringing down sand to the bottom. That could easily be removed. It was simply a matter of labour and of time, and, above all, of money, to remove the obstruction at Serapeum. He did not think that anything like the sum of 2,000,000*l.* would be required to make the canal easily navigable for the trade which was likely for some years to pass through it. When there was a uniform depth of twenty-three or twenty-four feet, which he believed would be sufficient, the canal would be of great advantage to the commerce of this country and of the whole world. It was not necessary that there should be an excessive depth of twenty-seven feet; for, by the simple process of lightening and trimming vessels, there would be no great difficulty in getting them through. Vessels of great tonnage and length had already passed through, and he believed one of four hundred feet, fully justifying what he had said when he was there, that he saw no earthly reason why a vessel of four hundred feet should not go through. He took a more sanguine view of the results of the opening of the canal than Lord Houghton did. He believed that the canal was destined to be the great channel of communication between the whole of India west of Cape Comorin and Europe. The trade of the Persian Gulf and parts of Arabia and Asia, which at present were not within the realms of commerce, would be developed. The railway systems of India bringing down the cotton of the Deccan and the products of vast fields of labour of Central India, would all converge upon Bombay, which appears to be the natural point of departure for the Suez Canal. Besides this, all the trade of the North-West which came by the Indus would find its outlet to Europe through the canal. He believed that its commerce would be more and more developed daily, and it was his sincere and earnest hope that the shipowners of this country would take advantage of the opportunity and make the best of it. With our unequalled powers of shipbuilding, it would be the fault of our own country if we did not reap the greatest benefit from the opening of the canal. It was perfectly true that a considerable commerce would go to the Adriatic and to the Levant, and to the Eastern Archipelago, but there was a still larger commerce to be developed. It was probable that even goods and materials bound for Northern Europe would pass through the canal and through the Mediterranean. Beyond that a very large field was opened in the Black Sea. Russia was making great endeavours to foster her trade and manufactures, and vessels might pass from Bombay laden with cotton through the canal, the Dardanelles, and the Bosphorus, and land their goods at the mouths of the Danube and at Odessa. He trusted that England would seize upon the opportunity and become carriers of that trade. English shipowners need have no fear whatever about the result. As railways have created traffic, so the canal would create traffic also; and as commerce increased, so the wants of mankind would be multiplied, and employment would be found both for the canal and for the route of Vasco de Gama around the Cape. As one ship after another passed through the canal and discovered the facilities which it afforded, so more and more would the attention of our merchants and shipowners be called to it,

and it would be the high road to the East, bringing the products of the East in their old channel through Arabia to the ports of Europe. There was not the smallest necessity for our own trade to suffer. Our entrepôt trade might be to some extent perhaps damaged, but that would be more than made up by the increase of communication and the growth of commerce.

Sir BARTLE FRERE said, up to the time when he traversed the unfinished works of the Suez Canal, a little more than two years ago, he had been a sceptic as to the possibility of completing it, and as to the probability of its being of much benefit to the great commerce between Europe and India; but he then came to the conclusion that it was likely to be quite as valuable to England, and to the bulky commerce which Englishmen carried on with India, as to the smaller commerce which must inevitably fall into the hands of those who were nearest to the canal. Even at that time the canal had reduced the price of coals at Suez some 16*s.* per ton. A very large proportion of the cotton which came to England from India was formerly brought by steamers through the Red Sea, then sent by railway to Alexandria, and again by steamers through the Mediterranean. This, of course, was a very expensive route, and the reduction of the expense, by sending the cotton in one ship through the canal, must lead to a very large increase in the trade. Traffic in many other articles would also be benefited. The mere fact that the canal would enable them to place a chest of indigo on board a ship in Calcutta or Bombay, and not have it moved again until it was taken out in London or Liverpool, was quite sufficient to show the great value of the new route. The great risk of breaking fragile articles would also be avoided. There would be no necessity to throw them about from one place to another, to remove them from the ship to the lighter, from the lighter to a railway-truck, from the railway-truck again to the lighter, and from the lighter to the ship on the other side. The absence of all this shaking and knocking about was of very great importance, not only with regard to the preservation, but also with regard to the expense of the articles. He had, therefore, come to the conclusion that the Suez Canal would be of the utmost importance to the great trade of India. One thing worthy of special notice was the immense results which had been produced by the use of mechanical engineering. This had a very remarkable bearing upon the connexion of Lord Palmerston with the work. One of the conditions upon which the great French engineers first set about the work was that they should be supplied with free labour—that the labourers should be made to work, as they did at the Pyramids, for a very small, and hardly sufficient ration of food. Of course such a plan would involve a very serious loss of life. Tens of thousands of lives were lost in the formation of the great canal between Alexandria and the Nile. This, almost as much as the territorial question, influenced Lord Palmerston. His whole life had been devoted to the suppression of slavery throughout the world; and he felt that it would not be becoming in him to be applying all his energies and all the resources of this country to putting down slavery elsewhere, while allowing it to grow up under his very feet on the Isthmus of Suez. It was this that led him to say that England never could consent to have the canal made in such a way. M. de Lesseps generously said to him (Sir Bartle Frere) that he felt it was to that resolution of Lord Palmerston that he owed the success of the enterprise, because he was thereby led to consider how he could make the canal with free labour, and so he turned his very great mind to the appliances of mechanical engineering. He said also that he found on the banks of the Thames, and the Clyde, and the Mersey, those appliances already at work in the great dredges by which those rivers are kept clear and improved. And it was by improvement upon those dredges that the French engineers were able to do their work in about half the time, and at about half the expense which the labours of the fellahs of Egypt would have

taken. This was a fact which ought to be remembered to the honour of Lord Palmerston.

Mr. FOWLER said, although he was unable to accept the invitation of the Khedive to be present at the opening of the canal, he was there about twelve months ago, and saw the works in progress. The wonderful dredges, of which so much had been said and written, were then at work, and there could be no doubt that to those dredges was due the fact that at this moment the canal was finished. M. de Lesseps, as was generally known, was not himself an engineer; but among the able engineers whom he collected about him was Mr. Lavelley, who, although a contractor by practice, was an engineer by education. Messrs. Borel and Lavelley were the contractors for the Suez Canal. Mr. Lavelley's early technical education was commenced and completed in France, but his practical education was commenced and completed in England. For many years he was in the best mechanical establishments of this country. He was thus well prepared to accept the contract for such an undertaking as the Suez Canal, where he found it necessary to invent and adapt mechanical appliances of various kinds; the dredges in use in the canal were totally different from those which had previously been used, and were of three kinds; the most remarkable being those which took up the excavation from the centre of the canal, and conveyed it in a semi-fluid state to a distance of 70 or 80 yards by means of suspended iron-work. These machines were invented or adapted almost entirely by Mr. Lavelley, and were constructed in England, in Belgium, and in France. It was such machines as these which had enabled M. de Lesseps to complete the canal in half the time, and at half the expense which would have been necessary if they had attempted to execute the work by the poor fellahs of Egypt. The difficulties of construct- the canal were principally four—viz., those at the entrance to Port Said; the supposed blowing of the sand of the desert into the canal; the washing away of the slopes; and the difficulty caused by the great evaporation of the vast expanse of the Bitter Lakes. The difficulties at Port Said arose from the alluvium brought down by the Nile, and taken along the coast towards the Bay of Pelusium; this was arrested by the works, and deposited in the harbour. Although, no doubt, this was a considerable difficulty, it was not one which was insurmountable. The effect of the washing of the slopes was a matter which experience only could settle, and would be readily met by works of protection. Many erroneous notions were prevalent as to the extent to which the canal was liable to be choked with the sand blown from the desert. A very large portion of the canal was through water. Lake Menzaleh occupied a con- considerable portion of the distance, and, of course, no sand could blow into the canal from the sides in that part of it. The Bitter Lakes and Lake Timsah also occupied a considerable distance, and therefore the portion liable to be acted upon by the sand was very short as compared with the total length of the canal. Those who constructed the canal were quite aware of the difficulty, and had tried various means of limiting it. By means of plants supplied with fresh water from the fresh-water canal, they were creating an oasis on each side of the canal, so as to throw back the desert, and thereby greatly diminish the quantity of sand brought into the water. During twelve months the quantity blown into the canal was 200,000 cubic metres; and this would be constantly diminishing by the operations of the fresh-water canal; it is well known that wherever any portion of the land of Egypt was watered it was pro- ductive, and generally yielded a profit. He therefore thought that the blowing of the sand, which at one time was supposed to be an insuperable difficulty, was really one of the smallest difficulties. With respect to the ques- tion of evaporation: the Bitter Lakes occupied about 100,000 acres, and the evaporation was very considerable, amounting to about 250,000,000 cubic feet daily. All that vast quantity must be supplied from the Red Sea and the

Mediterranean, but chiefly from the Red Sea. This would require a velocity of about 1¼ mile per hour from the Red Sea to supply the waste. In the Red Sea the spring tides rise 6 feet, the neap tides 2, and it was expected by some persons that the current from the Red Sea into the Bitter Lakes would be so rapid as to make it an impossibility for vessels to work against it. Such had not been found to be the case, although there must be a considerable indraught over and above the flow of the tide in order to supply the evaporation. The Bitter Lakes were formerly a part of the sea, and being cut off either by natural or artificial means, the evaporation went on until, in the course of a very long period, only a residuum of salt was left. When the water was first let in to the land, which formed a depression of the desert, the salt was in some places 90 feet thick. That had been gradually dissolved, and might now be said to form a part of the Red Sea or the Mediterranean. He entirely agreed with Sir F. Arrow and Sir Bartle Frere in their estimate of the advantages that would result from the opening of communication to India by means of the canal.

Mr. WYLLIE reminded the meeting that the canal would but restore the Indian traffic to its old route. Up to the discovery of the Cape of Good Hope the Red Sea formed the main channel of commercial communication between Europe and Asia; and the ancient rulers of Egypt were fully alive to the importance of establishing a continuous passage by water between the Red and the Mediterranean seas. The grand difference between all the ancient projects and the present one was that formerly the idea had always been not to cut right across the isthmus, but to connect the Red Sea with the Nile. That scheme had been carried out. The fresh-water canal, which gave life and sustenance to the maritime canal, was merely a revival of what was done by the Pharaohs and the Ptolemies, and still earlier princes. From the days of Sesostris down to the early centuries of the Christian era history teems with references to the existence of the institution and to its maintenance by successive operations of repair and new excavation. To give a familiar instance, in the days of Cleopatra the canal was in such a state of preservation that after the battle of Actium that princess had ideas of escaping down to the Red Sea with her lover by that means.

The PRESIDENT having thanked Lord Houghton for his address, the meeting was adjourned to January 24th.

Fifth Meeting, January 24, 1870.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*B. V. Boyle, Esq.; Henry Cook, Esq.*, M.D.; *Robert Clark, Esq.; William Nicholas, Esq.; James S. Wicheloe, Esq.; Alfred Müller, Esq.; Charles W. C. Hutton, Esq.; Lieut. J. Casberd Boteler*, R.N.; *Lieut.-Colonel H. L. Evans; J. L. Palmer, Esq.*, Surgeon R.N.

ELECTIONS.—*Robert George Clements, Esq.; George Dallas, Esq.; Robert Davenport, Esq.; Lieut.-Colonel Henry L. Evans* (late Bombay Army); *Edward M. Hopkins, Esq.; T. Scarborough Johnson, Esq.; Frederic Lassetter, Esq.; Alexander Lawrence, Esq.; Arthur Laing,*

Esq.; *G. F. Mare, Esq.*; *J. Alexander Man, Esq.* (Commissioner of Customs for Formosa); *Neville F. Mackay, Esq.*; *William John George Napier, Esq.* (Master of Napier); *John Linton Palmer, Esq.*, Surgeon R.N.; *Major E. B. Sladen* (Political Agent at the Court of H.M. the King of Burmah); *Emanuel Silva, Esq.*

ACCESSIONS TO THE LIBRARY from JANUARY 10TH to JANUARY 24TH, 1870.—'Origines, Migrations, Philologie, et Monuments Antiques.' Par le Duc du Roussillon. 2 vols., 1867. Donor, the author. 'Reise in das Gebiet des Weissen Nil,' &c. Von M. Th. V. Heuglin, 1869. Donor, the author. 'L'Oraison Dominicale en cent Langues.' Par S. Apostolides. Donor, the President. 'Geography of India.' Allen's Series, 1869. Donor, the author. 'Die Deutsche Auswanderung,' &c. Von J. J. Sturz. Berlin, 1869. Donor, the author.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF JANUARY 10TH, 1870.—A Map of Eastern part of China and Korea, showing the Routes of Messrs. Oxenham and Markham in 1868-9. Presented by A. Petermann. Map of the World, printed in colours, on Mr. Gall's projection. Eighteen copies of ditto on smaller scale. Two Maps of the Stars, on Mr. Gall's projection. Presented by Mr. Bartholomew. Map of the World, showing the Distribution of Butterflies, &c., by Gabriel Koch. Presented by A. Petermann. Map of Chili, on two sheets. Map of Transvaal Republic, &c., showing C. Mauch's route. Presented by A. Petermann. Fiskekart over den indre del af Vestfjorden, J. Lofoten. Adgivet af den geografiske Opmaaling, Kristiania, 1869 (on five sheets). Admiralty Charts (32 in number).

The PRESIDENT said that the first communication to be read was a letter from that remarkable traveller, Mr. Hayward, who had been employed by the Society to explore Pamir Land and Eastern Turkistan,—countries hitherto entirely unknown to geographers, British or Russian. One of the brothers Schlagintweit, under the auspices of the East India Company, had indeed reached Kashgar, but until Mr. Hayward performed his late journey no one had given any geographical details of that region, Adolf Schlagintweit having been assassinated at Kashgar. The letter had no reference to what Mr. Hayward has done, but to his projected journey to the Pamir Steppe, which no one from a civilized country had yet thoroughly examined. Lieut. Wood, indeed, did arrive at the source of the Oxus on the margin of that region, but, as a whole, we knew as yet almost nothing about the great lofty plateau called by the natives the Backbone of the World. It is of enormous altitude, and contains the sources of the Oxus and Zariafshan. Mr. Hayward had written to him (the President), saying that if he succeeded in passing the mountain tribes, which are continually warring with each other between Gilgit and the Pamir, and should not be able to return that way, he intended to come out on the other side, and in that case should meet a welcome reception by the officers in Russian Turkistan. He (the President) had thereupon made an application to that effect, and the Russian authorities had authorised the Governor-General of Turkistan to receive Mr. Hayward

with all hospitality, and to enable him to return to England through the Russian territories.

The Secretary (Mr. Markham) then read the following letter :—

"MY DEAR SIR, "Srinagar, Kashmir, 17th November, 1869.

"I am leaving here for Gilgit to-morrow, in the hope of being able to penetrate to the Pamir Steppe and the sources of the Oxus from that frontier.

"You will, I feel sure, be glad to learn that the difficulties which I had anticipated would be thrown in the way of my proceeding through Gilgit are not likely to occur.

"The Maharaja of Kashmir has kindly promised to assist me, and has guaranteed to protect the expedition for so far as his territory extends into Gilgit. Beyond the Kashmir boundary he cannot be responsible for its further safe progress, nor is it in his power to assist in any way beyond the frontier. Thus far circumstances promise well, and unquestionably great credit will be due to the Maharaja for his kindness and consideration, should success attend my efforts to reach the Pamir from his territory as a base.

"The officials here maintain the risk to be great, and give a very bad character to the tribes inhabiting the head of the Gilgit and Yassin valleys. Although not so fanatical as the Mahomedans further westward, they are sufficiently untrustworthy to render success very doubtful, and it is quite possible that I may be a second time foiled in my attempt to penetrate to the Pamir. The danger is certainly great, but I trust that, by taking every precaution and feeling the way carefully before advancing, it may be reduced to a minimum.

"I have been delayed here waiting for some instruments which, thanks to the kindness of the Government, have been forwarded to me at my application from the Mathematical Instrument Department, Calcutta. They have at length reached here, and I now possess a very complete set of instruments (and spare ones in case of accidents) suitable for the work in hand.

"I must not fail to mention that it has been very gratifying to me to have received the thanks of the Government of India for the information and map illustrating my late explorations in Central Asia which I have placed at its disposal; and that Government has most kindly given me the handsome sum of 100*l*. From my former communication you will be aware that I had applied for the assistance and sanction of the Government in my present expedition, and that the Government had thought fit to withhold its countenance from the enterprise. I frankly confess that I am perfectly satisfied with the attitude which the Government have assumed towards the expedition. It would be impolitic to accord me any official recognition and sanction, and so run the risk of complications with the frontier tribes. Moreover, I doubt whether such support and countenance would not be a constant source of anxiety to the explorer, lest, by any venturesome step, he should complicate his Government, which cannot now be the case, and a greater scope of freedom for exploration is thus afforded.

"Whether I shall be able to cross the passes at the head of Gilgit before the spring of next year is doubtful, and it may be found to be judicious to make a winter stay in Gilgit. Much ground might be accounted for between the Indus and the passes. Also the exact point where the meridian range of the Pamir intersects with the chains of the Hindu Kush and the Karakoram would be an important one to fix in the geography of Central Asia.

"If I can once succeed in crossing the passes leading from the head of Gilgit on to the Pamir, I still believe that reaching the Lake Karakul will be

a comparatively easy task, and that here physical difficulties and privations will alone have to be surmounted. Should all go well, you may, I think, count on my being near the great object of my research and the termination of my labours about the time of your anniversary meeting next May.

"Arrived at the Karakul, I shall find myself placed in a peculiar position. Alone in the heart of Central Asia, it will be a subject of much consideration whether an attempt should be made to return to India through the frontier tribes, or the shorter and, perhaps, safer way into Russian Turkistan should be followed. The latter would be desirable, since a connected series of observations, carried on from Boorji, on the Indus, across the Pamir and into the basin of the Jaxartes, should secure valuable scientific results.

"I will not fail to report the progress of the expedition as far as is practicable; but postal communication, even up to Gilgit, is, at this time of the year, very difficult.

"May I beg you to be good enough to remember me kindly to the Council of the Geographical Society, whose good wishes for the success of the enterprise I feel sure that I have, and

"Believe me, my dear Sir, yours very truly,

"To Sir R. Murchison. "GEORGE W. HAYWARD.

"The Kashmir Government is trying to dissuade me from going *viâ* Gilgit, not wishing an Englishman to see the exact state of that frontier. The dangers are, I think, exaggerated by the Kashmir officials, and I feel certain that every obstacle will be thrown in the way of proceeding beyond the Gilgit frontier. I shall find it very difficult to communicate with the Yassin or Hunza and Nagar people. The Maharaja has himself told me that only lately the Hunza people have made a raid and burnt some of his villages, and yesterday the news was received here that the Kashmir commandant of the Gilgit district had caught half-a-dozen of the Hunza folks, had mutilated them and then killed them, so that reprisals seem certain. It is impossible to say how an Englishman may be received, or if even they would allow him to come on. Even then he might not be allowed to proceed beyond Yassin or Hunza, and thus the prospect of being able to penetrate to the Pamir seems limited. However, I shall make the attempt; and if not allowed to go on, or even to enter from Gilgit, it will be a satisfaction to have tried one's best. In the event of having to turn back, an attempt must be made from some other frontier. I believe that I shall eventually succeed in the object of my labours, but it may take months, nay, years, to do so.

"I find that *Kashghar* is the proper rendering of the northern capital of the Kush Begis, and not Kashkar, as given on my map. The word was written out for me in Turkistan, and I have mistaken the *g* for *j*.

"It would be desirable if the elevations, as given on my map, &c., were computed by some one appointed by the Society's Secretary. I believe they are all somewhat under the true elevation, and, the boiling-point of water having been recorded, will admit of correction.

"By computation, according to the tables used by the Survey Department, I make the following to be the true elevations:—Yarkand, 4076 feet; Yarghissar, 4632 feet; Kashghar, 4512 feet."

The following paper was then read:—

A Visit to Easter Island, or Ropa-Nui. By J. L. PALMER, Esq., R.N.

[EXTRACTS.]

IT will suffice to say that this island is about 12 miles long, by 4 in its greatest breadth; in shape like a cocked-hat, its ends bluff

and high, and there is a tall hill (1100 feet) in its centre. There are no trees. In many parts of the island, which is entirely of volcanic origin, are craters of large size; but they have been long since extinct, and no tradition of their activity remains. I may mention one or two of them.

Terano Kau. This is at the south end, is about a mile in diameter at its brim, and about 700 feet deep. The bottom is of bog and sedgy grass; pools of water are scattered about it.

Terano Hau, much smaller, and quite dry. Here is the quarry of red tuff, from whence the crowns of the images were dug.

Otuiti, the Little (iti) Hill (otu), at the north-east end of the island. This is very similar to Terano Kau, but smaller. It stands isolated in a large plain, and from the grey lava of which its sides are composed all the images are made. Near the Terano Hau is a large hill of obsidian, which is capped with some kind of white earth. I was not at its summit. All the hills are rounded, and the soil on their slopes, which consists of decomposed lava, is very fertile.

The appearance of the natives has been commented on by nearly all visitors, especially the early ones. Mendaña says many were almost white, and had red hair; they were well-shaped, and of such stature that they had much the advantage of the Spaniards. Roggewin (1722) says the same, and so does Cook. The last account, sent by a Jesuit missionary (1864) to the Superior of his Order, agrees thoroughly: that among Polynesians they most resemble the Marquesan islanders; the features more European in type; as a rule, they were slightly copper-coloured, but many quite white. Three skulls were brought home, two of which are in the Museum of the Royal College of Surgeons.

"In their habits they were all thieves, and distrusted one another," says Frère Eugène; "and as the island abounds in grottoes and artificial hiding-places, these were, in consequence of their filchings, constantly in request." This disposition has now (1868) been entirely removed by the teaching of the Fathers, as we can vouch. They seem a very good-tempered race, indolent, fond of adorning themselves after their own fashion, very dexterous in plaiting grasses and carving wood, which they do with splinters of obsidian.

Their language has so much altered that it is impossible to say what it was originally. We gleaned a good many words, generally Polynesian. In Cook we find that the Otaheitan Oedi-di could not make himself readily understood. The Fathers told us the language was very poor.

The houses they now live in are much smaller than formerly. They are something like a canoe overset; a framework of sticks made, and on this grass is thatched. A fair-sized house now is 30 feet long by 12 or 14 broad, and 5½ high. But they were 200 feet long; and those used for their assemblings, dancings, and choral purposes, were raised on low stone walls, on which thatching was arched. The house is windowless; no hearth nor fire; one aperture in the side, of about 18 to 20 inches square: this is closed by a net, to exclude the fowls. As the natives pack pretty closely in these, the heat and smell are indescribable.

Before the missionaries came these people believed in one God, a spirit, from whom and by whom they were made from the earth, not as a pot or image, but as a plant; that they were his children, but that there was no female deity. They did not worship images, although they had plenty of little wooden ones, which they hung up in their dwellings. Nor were the giant images, soon to be mentioned, objects of worship. *Taboo*, for persons, as well as *rahui*, for possessions and crops, were in full force, as in the other islands.

In burying their dead, all that was done was to swathe the corpse in a bale of grass and sedge, and lay it on the cemetery platform, with its head to the sea, each tribe having its own platform. They, for this reason, dislike Christian burial; and just before our visit (1868) a woman, whose child had been buried, rose at night, exhumed the body, and deposited it on the platform of the tribe, which was some 2 leagues distant. All the survivors of these people now are massed at Angarca.

We were not able to find out much of their history or their traditions, for many reasons. All we learnt from the Jesuit Fathers was that it was a current belief that many centuries ago a large migration took place from Oparo (Rapa-iti) hitherwards; that the chief or king was called Too-koo-i-oo; that for some time he lived at Otuiti, and caused the images to be made; that subsequently he went to reside at the Hare-maia, at the Terano Kau; that the images followed him of their own accord, walking by night; that some went upon the platforms, others were left on the road, where now they can be seen; that at his death he disappeared from earth in the form of a butterfly (called purupuru), and the small people now call, on seeing these insects, which are not very common, "Tookooioo! Tookooioo!" There is no hint as to his reappearance. From this migration the island is called Rapanui. Oparo is distant above 1900 miles due west.

I must now speak of the remains, which apparently have been made by a race passed away, although it is possible that these

people may have partially continued their construction and fabrication. Those of the most modern date are the wooden "household *idols*," though not *idols*, really lares or teraphim.

These are very various, many peculiarly grotesque; some I saw of immense age, some made only a few months. With regard to those which are carved in human shape, they are generally of undoubted male sex, and give the impression of a human body when flayed. They are a foot or more in length, made of a dark compact wood (Toromiro, an *Edwardsia*); the profile strongly aquiline, the lips apart, so as to give a grin; obsidian eye-balls; a small tuft on the chin; the ears with long, dilated lobes; the figure a little bowed; arms by the side, and the hands flat on the side of the thighs. They are very well carved. The female figures are ruder and flatter, as well as larger in size; a small tuft on the chin also; the attitude that of a pancake Venus de Medici. Lizards, sharks, fowls, and other things were also carved; some are in the possession of the Rev. Wm. Dearden.

On the heads of the male images are carved, in very low relief, the most peculiar figures, evidently mythic; sometimes a double-headed bird, or a fish, or a monkey, or lizard, or some figures in which cannot be recognised a likeness to anything. I saw but one female figure thus adorned. Although they still carve them, I believe that the present people are not aware of the myths they represent; we could not find it out. These *Lares* were not worshipped.

The next remains which are of the greatest age are the sculptured stones on the brink of sea-cliffs at the Terano Kau: they are at the part where the last lava-stream issued, and now overlook the sea. The blocks are of various sizes, carved *in situ* with rude tortoise-form, or have odd faces made on them. The vervain-bushes and grass much obscure them; and I was much pressed for time, and my visit was at that most unfavourable time midday, or I should have been able to trace and sketch many more than I have been able to do. They are very worthy of study.

Close to the blocks, in irregular rows, are a number, say eighty or more, of houses, of great age, now not used, and mostly in capital preservation.

Each house is oblong oval, built of irregular flat pieces of stone; the walls rise to about 5½ feet, the door being in the side, as in the present grass ones, and of the same size, always *towards* the sea, 20 inches. The walls are very thick, 5 feet at least, which makes the entrance quite a passage; on entering are found for the side walls slabs, say 4 feet high, and not so broad, ranged upright; above these, small thin slabs were ranged like tiles overlapping, and so

gradually arching till the roof was able to be spanned over by long thin slabs of 5 or 5½ feet. The roofing slabs being not more than 6 inches thick and 2 feet wide. The interior, or Big Hall, would be in dimension, 16 paces long, by 5 wide, and fully 6½ feet high under the centre slab.

The passage or door leading to it was paved with thin slabs, and under these was a kind of blind drain, which extended to the distance of about 6 feet outside, and there also was covered with flat slabs, its dimensions being still those of the passage; it was carefully built, squared, and terminated abruptly and squarely.

In these drains I was informed the dead men (*keaka*, victims) were kept till required for the feasts.

Outside this Big Hall, and at right angles to it, were smaller chambers; these did not usually communicate with it, but had special doors from the outside. I was told they were generally used as women's apartments.

The upright slabs which formed the wall of the Hall, and the roofing slabs, were painted in red, black, and white, with all kinds of figures and devices; some were like geometric figures, or rapas, M'hanua. Eronié, faces, birds, Hiki Naü, and other figures. Among these mural paintings were rude tracings of sheep, horses, and ships with ratlines to the rigging. These were all very new, and have misled some to the impression that the structures were equally recent. There was no apparent pavement in the Big Hall, and in many of them a great quantity of small univalves like periwinkles was found.

It was in one of these, the most south-westerly, that the Image Hoa-haka-nana-Ia was found and removed. It was but a small house about 20 feet across, and two chambers communicated inside with it, no painting on the slabs could I trace, the doors were always towards the sea. We inquired, but were all told that in no other house was there another image.

The Papakoo, or cemetery, is a terrace or platform, generally near the sea, made of the rolled sea-stones, faced seawards by a strong wall made of large irregularly square stones, fitted together without cement; the ends of this terrace are whitened. These terraces are about 100 yards long; one or two were found without the facing wall,—they were probably unfinished.

There were a few inland, but I have no notes of them, except that on the flank of the Terano Kau, leading from Winipoo, there was a moated enclosure, and at one side of it a raised terrace, overgrown with turf and grass, yet, we were told, a papakoo, and near it a small trunk image, like Hoa-hava, three fourths buried in the soil.

Where there was a solitary small image, we were led to infer a papakoo had existed; as to Hoa-hava, we were told, "Many, many dead round about!"

The square structures used for sepulture I noticed under the head of houses, they were whitened, and I could not learn for what individuals in especial they were used.

I must now describe the images, &c., the platforms on which they stood, with the peculiarities found in their neighbourhood, as no images stood on the papakoo in a like manner; and to begin with the platforms.

These structures can be seen on nearly every headland, and, as a rule, they are at no great distance from the sea; being built on the sloping land, the sea-front is always taller than that which looks landwards. They are variable in size, sometimes very large, and, to give an idea of them, I had better perhaps describe a very fine one which is on the coast, half-way between Winipoo and Otitui: I have usually called it the fifteen-image platform.

Seawards, just where the ground becomes broken as it nears the cliffs, is built a very stout wall. The height of this is now very much obscured in consequence of rubbish, broken images which have been toppled over, and vegetable growth, as reeds, &c.: but it seems about 7 or 8 yards. The stones, which are large, are irregular both in size and shape, though more or less four-sided, and some fully 6 feet in length, unhewn, and fitted together without cement or mortar, but with great exactness.

This wall is built flat and level at the top, and is about 30 feet broad, by 100 paces long, squared at each end; parallel to the sea-shore in its direction. This constituted, in fact, the platform, on which were thin slabs which served as pedestals for the images.

Landwards, it seemed to be not much more than a yard high, and on this side also was much dilapidated, especially about the centre.

Before it, in this direction, was a smooth space or terrace, of the same length as the platform, but of four times its breadth, at least; and this terminated in front by a low façade or step, built of stone and about as high as that of the platform seemed to be from the same point of view. The terrace sloped gently to this step, and the ends were built square and raised above the adjoining ground, so as to join the ends of the platform. The image platform was strewn with bones in all directions. They were very old and weather-worn, but bore no marks of fire on them. The images had been thrown down in various directions, and were all more or less mutilated.

The débris prevented my being able to see if there was any crypt

under these images, or in the platform, as at Winipoo, and the openings must have been either at the ends of the platform or in its sea-front, I think, if any exist.

At a little distance from the low terrace, and somewhat near the centre line, was a red pillar or cylinder of red tuff, standing on an area paved with large smooth sea-worn stones. This pillar stood on a low pedestal slab of the same material as itself.

It was about 6 feet high, and as much in diameter; its top was flat and was cut away a little on each side, so as to make a step or shelf. On it I found two skulls very much perished, which, from the dentition, I judged to be of youths 12 or 14 years old. The faces of these skulls were directed towards the platform.

Again, in a direct line landwards, and at about 80 or 100 yards from this, is one of the low, slanting, saddle-topped pillars used for cremation. It is of red tuff also, but only 4½ or 5 feet high; as there is a very fine one at Winipoo, I append its description.

On a paved area, similar to that of the *Altar* (?), is a pillar of red tuff, in height 8½ to 8¾ feet and 3½ feet square. The top projects forwards, and ends in two *horns* with a saddle-shaped notch cut deeply between them. Each horn had a face traced on it, in very low relief; but that to the north-west has crumbled away. The projecting part is indicated as low as the breast, lower down a round projecting navel is marked, and just above, where the pillar joins the area, the fingers are sculptured flat and clasping the hips, as in the images.

We were told victims (*keaka*) were burnt here; at the foot of one pillar we found many burnt bones.

The images are now all thrown down. In no place, we were assured, is one on its platform. They are very numerous, even to hundreds. In my walk to Otuiti I began to count, but found them so plentiful as to render it lost time.

They are made of but one material, a grey compact lava (Trachyte), found in the crater of Otuiti; and there is a distinct *slide* for them to be taken out by, so to say; and imperfect ones are found. In form they are trunks, terminating at the hips, the arms close to the side, the hands sculptured in low relief and clasping the hips.

They are flatter than the natural body. The longest I measured, 34 feet; the usual size 15 to 18. The smallest, as Hoa-hava, 4½ or 5 feet; and these were more boulder-shaped. The head is very flat, the top of the forehead cut off level, so as to allow a crown to be put on. This was not done till the image was on its platform.

In the giant images found outside the crater of Otuiti, the head seemed to project before the line of the trunk, which I did not

observe in any others. These were of the largest size; the head and neck measured full 20 feet. Many of them were upright, embedded in the soil, and were those in the best preservation. Those inside the crater were also of great size, and very weather-worn; they seemed to differ a little in profile, and also to be the oldest in the island of those I saw.

The face is square, massive, and sternly disdainful in expression, the aspect always upwards. The peculiar feature is the excessive shortness of the upper lip or the upthrusting of the lower one, which would produce the same effect? (This gesture is now and then seen in the present race.)

The eye-sockets are deep, close under the brow; and, as far as we could make out, eyeballs of obsidian were inserted, but we were not fortunate enough to find any. The nose broad, nostrils expanded. The profile, I have said, varied a little in various images. The ears were sculptured always with very long pendant lobes.

The beautifully perfect one, Hoa-haka-nana Ia (each has its name), which is now in the British Museum, was found in the stone house called Tau-ra-re-gna, at the Terano Kau. It is elaborately traced over the back and head with rapas and birds, two of which much resemble the apteryx. It was also coloured red and white, but this colour was washed off in its transit to the *Topaze*. Its height is about 8 feet, and weight 4 tons. It was found buried waist-deep in the ground, had no crown, its face turned from the sea, as those of all the others were.

It was the only image under cover, though some idea has been that there were some submerged in a cave. We believe that this was entertained by misconception of some mural paintings found in one.

The crowns (Hau) which were put on these images are made of red tuff found in the Terano Hau crater, down the outer slope of which were as many as thirty waiting for removal to the various platforms. The largest I measured was 10½ feet in diameter. In shape they are short truncated cones, or nearly cylindrical.

In the coast-track both to Otniti from Winipoo and from Anakena, many of these images were found on either side of the way; but on the mid-island track I passed but two or three. These were all very large,—24 to 33 feet. They all lie face downwards.

The number on each platform is very variable, nor are they of uniform size on the same platform; at one (the north-east) end

of the fifteen-image platform, some five are quite dwarfs in comparison to the rest. They all faced landwards, when in position.

The implement used in carving these was a long boulder-pebble, in shape somewhat like a large rolling-pin or incisor-tooth, with an edge produced by chipping and then rubbing down with obsidian-dust. There was but one seen; it is now, I believe, in the British Museum. It was given by the Fathers to Commodore Powell. Its name was Tingi-tingi.

Our argument in favour of the images being the work of a former race is this same lack of chisels.

The paper will be published entire in the 'Journal,' Vol. xl.

The PRESIDENT said that Mr. Palmer described the island in so graphic a manner that all who had listened to the paper must be willing to return their best thanks to him. The gigantic monuments, specimens of which have been placed in the British Museum, open out a large field of inquiry. How is it that this little island, only 12 miles by 4, contains these immense statues? They seemed to point to former times, and to a powerful people.

Mr. C. MARKHAM said, in reflecting upon the origin of the civilization of Peru, one naturally turns first to the east, for it is almost certain that the Peruvians had no communication with any civilization on the American continent to the north, either with the Muyscas or with Mexico. He had always looked to find some stepping-stone by which the Peruvians might have reached the west coast of America from Asia, and it now struck him that it was possible Easter Island was such a stepping-stone. Captain Cook in his account merely conveyed the idea that there were six or seven images on one platform, but now Mr. Palmer had informed them that there are many hundreds scattered over the island. He thought it was impossible to suppose that any people permanently established there would have been in the habit of constructing these gigantic works. It might have been that, ages ago, when the route was first found out, migrations continued year after year, and people arriving on this island, and finding the monuments of their comrades' presence, continued the works. Of course this was but speculation, but it is strengthened by what is known of Peru. In that country there were two distinct civilizations, of different origin; one the Quichua, the other the Aymara, near the lake of Titicaca. The Quichua works consist of walls and slabs of masonry, but with no carving of any description, beyond a few representations of serpents in relief. The Aymara works, on the contrary, are covered with images and sculptures of various kinds. These are found especially on the islands of the Lake Titicaca, and in the ruins of the city of Tiahuanoca, at its southern end. When the Spaniards conquered the country there were at Tiahuanoca ruins of platforms similar to those on Easter Island, upon which were statues also resembling, to a certain extent, those of Easter Island. They represented giants with enormous ears, and with crowns on their heads, or conical caps. There, however, the resemblance appeared to end, for the Aymara images were very ornate. Curves or circles ran around the upper parts of the caps, and circles of human heads were placed just above the foreheads. The ears had long pendants ending in human heads, and there were also curves running from the corner of the eye and terminating in serpents crawling all round the neck. Some had necklaces of human heads. One of the old Spaniards who visited the ruins says that the images were not confined to the platforms, but were "marching all about the country," and through the rivers, in vast quan-

ities. It was impossible not to be struck with the resemblance between these remains and those on Easter Island. Acosta informs us that the Peruvians were in the habit of sending boats to certain islands, but that is all that is known of their navigation. Mr. Palmer had told him, that further to the eastward, on Mahlen Island, between Tahiti and the Sandwich Islands, a masonry platform has been found under the guano somewhat resembling those of Easter Island. This was another indication of the direction which the Peruvians might have taken. He looked upon it as perfectly clear that the present inhabitants of Easter Island are simply Polynesians, although the vocabulary of the island has not yet been collected to any great extent, and that they cannot belong to the race that erected these enormous works. As it was difficult to say what number of years it had taken to accumulate the guano found above these masonry platforms, he thought Captain Peacock might be able to give some information on this point.

Captain PEACOCK said, in some parts of the Chincha Islands he had found the guano 120 feet deep. He had examined some of it, cut into inch cubes from the lower portions, with a microscope, and found the layers very distinct, one above the other, like the leaves of a book, and he had calculated, from what he considered twenty-four hours' deposit, that four thousand years must have been occupied in accumulating the guano to a depth of 120 feet, but of course this was to a certain extent a speculative theory.

Mr. P. P. BLYTH said, he visited Easter Island in 1826. The people were a very fine race, and he was delighted to hear that missionaries have been there, and have succeeded in somewhat ameliorating their condition. They did not resemble the people of Tahiti, being perfectly white. The island is far too small for them, affording no room for an increase of population.

Admiral BELCHER said, in 1825 he visited the island in the *Blossom*. Thirty-six persons landed, and, at first, it appeared as though they would be received in a most friendly way; but, when the first lieutenant began to distribute his presents, the natives were dissatisfied, and began to throw stones. The landing party were driven off, many of them being severely wounded. The women of the Marquesas Islands are reputed to be the finest in the Pacific, but those of Easter Island surpass them. The men are of much greater stature than the Peruvians. Terraces, similar to those on Easter Island, are found in Tahiti, and several of the low islands of the Pacific. They are cut with remarkable accuracy, some of the stones being from 4 feet to 5 feet long, 16 inches in depth, and 18 inches wide.* The ornaments worn by the natives of Easter Island are precisely similar to those worn by the natives of New Guinea. He met with some natives on one island who had been driven there out of their course. They had intended to go west, but had been driven to the south-east. It was not, therefore, improbable that some might have been driven to Easter Island from Tahiti, in their double canoes, which are about 80 feet long. The language of the island is also totally different from that of Peru. It is the language of the whole of the Sandwich Islands, or South Sea group, and is also the language of New Zealand. It was, therefore, perfectly useless to look to Peru as their origin. Figures somewhat similar to those which had been described continue from Peru up to Behring's Straits. Some

* Extract from journal :—

"Eleven steps of 5 feet 4 inches by 3 feet 9 inches, each stone squared, making the perpendicular height to be 44 feet: lower stones, 3 feet; length at base, 340 feet (external measurement); width, 78 feet; height, 44 feet. This immense structure is raised on a rocky, paved, basaltic base—blocks of first course 4 feet 6 inches by 2 in height. Two inches within this course, 3 tons of stone rounded by attrition (beach or torrent), but squared on the longest sides, leaving the projecting ends convex. All the angular outlines were of worked coral slabs, and exhibited a white glaring mass. The summit had images, but of small size."

in British Columbia are most beautifully cut and engraved, having rather an Egyptian than any other form.

Mr. A. W. FRANKS said the tradition of the Easter Islanders seemed to point to one of the islands of Polynesia as their origin. This question must, to a great extent, be settled by nautical observations as to directions of currents, &c. The natives themselves say they came from Opato, one of the Austral Islands. With regard to the origin of the stone images, it seemed to him that the small wooden figures, which are still made and sold to visitors, bear a certain similarity to the stone images, which would scarcely exist if the present inhabitants were not intimately connected with the race that formed the earlier statues. The modern images show the same peculiarities in the ears, as well as in the projecting bones of the ankles and wrists. In all alike certain parts are left in high relief, while other equally prominent parts of the structure are not exhibited. There is a similarity, too, in the peculiar way of drawing the back-bone. One of the large images has on its back representations of three of the little dancing-paddles or clubs which are still used by the natives in their dances. The inlaying of the eye-balls with obsidian, too, is characteristic both of the wooden and the stone figures. All these little points of resemblance led him to the conclusion that all the figures were the workmanship of the same race, though, no doubt, there was a considerable difference of time between them. There has been a considerable change in the style of art in the island since the days of Captain Cook. The attenuated wooden figures alluded to by Mr. Palmer are of recent date; those of the times of Captain Cook are plumper, without such excessively projecting noses. As, then, a change has taken place in modern times, it is not improbable that previously a change had occurred sufficient to account for the difference between the wooden figures and the stone ones. The Islanders themselves say that the statues were those of chiefs; if so, this would resemble the practice in Sandwich and other islands of the Pacific, stone being substituted for wood. The difference of material might be accounted for by the scarcity of wood in Easter Island, there being no forest trees there of sufficient size for the purpose.

Admiral BELCHER said, the figures and ornaments brought off to the boats in 1825 were entirely of stone. When the landing-party would not purchase them they were thrown into the boats, and on the seamen casting them overboard the women dived instantly and recovered them before they reached the bottom.

Sir GEORGE GREY said his views coincided with those of Mr. Franks. The New Zealanders, like all the Polynesian races, have a peculiar facility in the art of carving, and they delight to practise it. They are rather an idle people, and like to occupy themselves in carving or making nets, or other employments of that kind, during which they can talk and feast. The New Zealanders carve images in wood, extremely like those on Easter Island, for the purpose of commemorating their ancestors, and they give to them the names of their forefathers. The Polynesians are also an exceedingly imitative and jealous people: anything that one chief possesses others must possess also, if they can possibly obtain them. There is in New Zealand a tradition among the natives that in the country from which they came originally the people carved in stone, and he (Sir George Grey) had in his possession a small stone image of a kind of red basalt, a sort of stone which is not known to exist on the island, and it was supposed to have been brought here from the original country. He had also seen a stone image there, which was considered extremely sacred, about 4 feet high. He thought it was extremely easy to account for the images on Easter Island, if the inhabitants had for centuries been Polynesians. If only eight or ten images were made in that number of years, a very few centuries would suffice to cover the Island with them. If the

wooden images of New Zealand had not decayed there would be hundreds of thousands of them by this time. Most probably there are at present as many as a hundred thousand there of wood. The language, too, of Easter Island is distinctly a Polynesian language. But on this point a difficulty arises about Peru, for "Titicaca," the name of the lake which Mr. Markham alluded to, is a Polynesian word.*

Mr. MARKHAM. It means the rock of lead.

Sir GEORGE GREY said it would not mean that in a Polynesian language. However, he felt convinced that the images were the work of a Polynesian race, and what he had heard from Admiral Belcher confirmed that view.

The PRESIDENT said he was to a great extent convinced by the reasoning that had been opposed to the Peruvian theory. He certainly was astonished that in this small island such wonderful works had been carried out. Still the material of which the large images are made is so friable and easily worked, that the difficulty of forming them would probably be even less than if wood had been used.

Mr. PALMER said, he found the people the most happy in the world. Nothing could exceed their joy at seeing the strangers. They danced about and welcomed them just like pet dogs. There are now only about 900 there, of whom 300 are women, and they are rapidly dying out. They were living on half a rat a day when he was there. They would not work; it was much easier to sit down and look at anything that was going on. There appeared to be plenty of fowls on the island, but he never saw one cooked, and the people do not care about eggs. Since the raid made upon them by the Peruvians, they have all lived near Cook's Bay, and there they seem to be contentedly waiting their doom. They have been entirely cured of thieving. A very few years ago they filched like all the other Polynesians, but now they never think of touching anything that does not belong to them without permission. When they were allowed to take some pieces of soiled paper, they ran and washed it in sea-water, showing what impression they had of it. They were very good people indeed.

Sixth Meeting, February 14th, 1870.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Dr. Wm. H. Colcill; R. G. Clements, Esq.*

ELECTIONS.—*Rev. Thomas H. Brain*, B.D.; *John Edward Dawson, Esq.; Edward Hutchins, Esq.; James Irvine, Esq.; Mark Henry Lackersteen, Esq.*, M.D., &c.; *Joseph Moore, Esq.; Commander Noel Osborn*, R.N.; *James Nisbet Robertson, Esq.; Joseph Starling, Esq.; Henry Stillwell, Esq.*, M.D.; *Charles Stenning, Esq.; John Wilton, Esq.*, M.D.

* Since the Meeting, Sir George Grey has informed the Editor that an account of stone platforms and chambers, analogous to those of Easter Island, has been given by Captain J. Vine Hall, in a Memoir on the Island of Rapa or Oparo, published in the 'Transactions and Proceedings of the New Zealand Institute,' vol. i. p. 138. This is important, in connexion with the tradition of the present inhabitants of their migration from Oparo.

Accessions to the Library from January 24th to February 14th.—'Marocco, 1814.' By J. G. Jackson. Third Edition. Purchased. Murray's 'Handbook for Spain.' By R. Ford. 1869. Purchased. 'The Native Races of Russia Illustrated' (in Russian). Donor, W. Egerton Hubbard, Esq. 'Les Hindous.' Par F. Baltazard Solvyns. Paris, 1808-1811. Donor, C. Holte Bracebridge, Esq. 'Spain to the Sahara.' By M. B. Edwards. 1868. Purchased. 'Two Years in Ava, 1824-26.' Purchased. 'Winter Tour in Spain, 1868.' Purchased. 'Roughing it in Crete, 1868.' By J. E. St. H. Skinner. Purchased. 'Rambles in the Deserts of Syria, 1864.' Purchased. 'Life of Las Casas.' By A. Helps. 1868. Purchased. 'Japan, 1869.' By E. P. Elmhirst and R. M. Jephson. Purchased. 'A Year in Sweden.' By H. Marryat. 1862. Purchased. 'Ruined Cities within Numidian and Carthagenian Territories.' By N. Davis. 'The Levant, the Black Sea, and the Danube.' By A. Arnold. 2 vols. 1868. Purchased. 'Victoria, 1864.' By W. Westgarth. Purchased. Siebold's 'Nippon.' 6 vols. Leyden, 1852. Purchased. 'A Fortnight in Egypt, 1869.' By Sir F. Arrow. Donor, the author.

The following paper was read :—

On the Runn of Cutch, and Neighbouring Region. By Sir H. Bartle E. Frere, K.C.B., &c.

[Abstract.]

The author commenced by defining the region he was about to describe, as a broad belt of country lying between the Indus on the west and the Arivalli Mountains on the east, and extending from the foot of the Himalaya to the Peninsula of Cutch on the Indian Ocean; the length was about 600 miles, and its breadth varied from 100 to 150 miles. The southern portion was formed by the singular tract of country called the Runn of Cutch, which forms a level plain 150 miles in length, lying a little lower than the region around it, and distinguished by the total absence of vegetation. It forms, during the greater part of the year, a plain of firm sand, saturated with salt, on which the hoofs of horses and camels in passing make scarcely any impression. It is so level that a moderate rainfall remains like a vast slop on the surface, and is blown about by the wind until it evaporates. During the south-west monsoon, however, the high tides flow into it and meeting heavy land-floods brought down by the River Loonee, cover it with water to the depth of one or two feet. Travellers and caravans pass over it, but travellers without a guide are sometimes lost, for there are absolutely

no landmarks; the danger is somewhat lessened on the side of the hills of Cutch by a beacon-fire, which is regularly lighted by a Mohammedan family there settled, to whom has descended the religious duty of thus guiding the wandering traveller over this desolate waste. The surface remains damp even in the driest season, and the soil never pulverises. Mirage and other surprising atmospheric phenomena are common in this singular district. North of the Runn, the desert waterless tract is called the Thurr. The whole region slopes very gradually from the sub-Himalayan ranges, between the Jumna and the Sutlej, towards the south-west. The rivers descending from these lower ranges disappear as they advance into the desert, and none of them reaches the Indus. The Thurr is covered with a constant succession of sandy ridges, rising as high as 200 feet above the valleys, and the aspect of the country is like that of a billowy ocean converted into sand. In districts where rain falls, and where the inhabitants have dug wells, some of which are 300 feet deep, there are cultivation and settlements; but the soil is throughout sandy, and not a stone can be found, that is not imported, over the whole region. Those parts, chiefly on the eastern and western borders, where a hard level plain exists as a basis whence rise the abrupt sandhills, are called the "Put." Sir Bartle believed that these three native terms of "Runn," "Thurr," and "Put" might be adopted in physical geography, and used in future maps of Cutch and Sind, as denoting varieties of plain which are totally unlike savannah, prairie, steppe, pampa, or any other description of land-surface known in the world. The Thurr presents a great obstacle to communication between the countries lying to the east and west of it. Travellers in attempting to cross it are subject to sudden death, not only from the effects of sunstroke, but from some peculiar condition of the atmosphere connected with the intense heat and the nature of the soil, like sunstroke in effect, but not caused by the sun, as instances are known of the fatal attacks occurring after sunset. The Runn of Cutch and region to the north of it are much subject to volcanic disturbance. The great earthquake of 1819 is still remembered by the inhabitants; it was described by Sir Alexander (then Lieutenant) Burns, in an admirable paper on the Indus, read before the Royal Geographical Society in 1833, from which Sir Charles Lyell drew most of his facts regarding the geology of this strange region. But a more important feature is the great frequency of slight shocks or tremors, and Sir Bartle was inclined to attribute the singular levelness of the salt-plain of Cutch to these vibrations. During earthquakes, mounds are thrown up, some of which are 10 or 12 miles in length, and of considerable height. These mounds are

formed. Sir Bartle believed, by a crack or fissure of the surface at right angles to the direction of the earthquake wave, one lip of the fissure being tilted up and overlapping the other, so as to form a ridge. Small craters and hillocks of ejected sand are sometimes formed on the surface of the Runn, which afterwards subside again to the level of the plain. Dry beds of rivers are traceable throughout the desert tract to the north. After describing further earthquake phenomena, the climate, productions, and the ruined cities of the Desert and its borders, Sir Bartle gave some very interesting details of the present inhabitants. The Thurr, he said, from the difficulties of access, had been for centuries the place of refuge to remnants of various races and nations who had invaded or succumbed to the fortunes of war in Hindostan. Here are still to be met specimens of the wild Bheels who claim to be the autochthones, and whose blood is essential to ratify every solemn ceremony of the Rajpoot dynasties; Coolies, who are anterior to the earliest Hindoo immigrants; Jats, who are said to be of Scythian origin, and who are hardly ever known to forsake their ancestral occupation as breeders of cattle. Hindoos of every tribe and caste are here found, and many representatives of later immigrations,—Beloochies, Afghans, Kurds, Arabs, and even Turcomans. One tribe of Rajpoots in the Desert, the Sodas, retain their primitive custom of bringing up all their female children, and, in consequence, all the chiefs in Rajpootana, where female infanticide had become established, have had for ages to take their wives from the humble Soda settlements. The poor Soda chiefs have, therefore, powerful connexions among their wealthy sons-in-law, and although they often pay a round of visits among them, they are said never to exchange their lives of freedom and simplicity in the desert for the palaces of Rajpootana.

This paper will be printed entire in the 'Journal,' vol. xl.

The PRESIDENT, after thanking Sir Bartle Frere in the name of the Society, said, he always liked to connect geology with geography, and therefore he was pleased that the region around Cutch had been dealt with geologically in the paper. No doubt the formation of the great desert and the Runn had been ascribed to true causes; but these wonderful phenomena of hills, 200 feet or 300 feet high, having been thrown up, and towns destroyed, by earthquakes, were not to be compared with what must have occurred in ancient times, when the sea and the land changed places by hundreds of feet at a time. He would not admit that any number of those smaller movements which have produced changes in modern times could have wrought the great effects of ancient days.

Lord NAPIER said he personally knew how much Sir Bartle Frere's knowledge and love of the people in the Bombay Presidency had enabled him to devise plans for the improvement of the country he had described in the paper.

If those plans had been carried out, a very great change would have been effected on the borders of that desert country.

Mr. GEORGE CAMPBELL said he had a very intimate knowledge of the country between the Jumna and the Sutlej, and took an interest in the lost River Suraswati; for, when he was a young man, he resided on its banks. The situation of the upper part of the river is beyond doubt, but the further course is unknown, and he had hoped that Sir Bartle Frere would have suggested some probable direction which it took. Although the rivers in the district seem very much puzzled where to go, they have no doubt on one point—they all trend towards the Indus, and not towards the Ganges. The River Suraswati itself rises within a mile or two of the basin of the Jumna, and falls into the Kugger, or Gugger, which at present is supplied with water by a canal brought from the Jumna. He took exception to the Jats being termed non-Aryan. He thought that, in feature and in speech, they are evidently Aryan. Almost all the Sikhs are Jats, and a finer-looking people are not to be found in the world. He wished to ask Sir Bartle Frere to what extent he thought it probable that railway or canal communication might eventually be looked for between Scinde and Rajpootana, either from Hyderabad, along the north of the Runn of Cutch to Deesa, and so to Agra, Delhi, or, on the other side, by connecting with Baroda, and so with the rest of India.

Sir BARTLE FRERE, in reply, stated that throughout the whole of the upper part of the desert, and at least as far down as Omurkot, traces are to be found of very large ancient river-beds. One of them comes from Bhawulpore quite in the northern part, and then runs down parallel to, and about 20 miles from the western edge of the desert. It is traceable at different points to a level with Rorre. It is apparently continuous, and might very well serve for the course of the Suraswati or the Kugger, if it should be found possible to connect them by levelling, but the general levels of the country are so nearly uniform, that it would require very careful surveying to make out the relative levels of these different river-beds. They are very large and very well marked, and are clearly not ancient beds of the Indus. Further down many other old beds are found, such as the Eastern Narra, which descends from near Rorre down past Omurkot, and is traceable as a distinct river-bed to the Runn of Cutch. This has lately had water restored to it by a canal, which has been cut to connect it with the Indus, and an old prophecy has been fulfilled, which used to be in the mouths of the Scindes when it was first talked of—that when the fish of Rorre and the lotus shall be found down at Cutch, then a white race will reign in Scinde. He did not know whether the prophecy was invented after the event or not, but it was current at the time when Sir Charles Napier first employed Sir William Baker to survey the course and to draw out the plan of a canal, which has since been carried out. It is quite possible that the Eastern Narra may never have been a bed of the ancient Indus, but may have had its former supply of water from some source to the eastward of the Sutlej. With regard to the Jats, he was fully prepared to allow them to be Scythians, and if Mr. Campbell would define what a Scythian was, he (Sir Bartle Frere) was ready to define what an Aryan meant. He believed it quite possible to run either a canal or railway from Hydrabad either straight across by Omurkot to Balmere, or round the south of the desert towards Deesa, so as to communicate with the system of railways which has been devised for Rajpootana. Of course there are great difficulties owing to the want of fresh water; but if a person started on horseback from Hyderabad, and travelled to Ahmedabad, with the exception of the step of a few feet down to the Runn of Cutch and the step out again, he would find nothing to vary the visible elevation; and in such a country of course anything like railway or canal construction is peculiarly easy. The question is merely one of fresh water, and, considering what has been done in this respect in connection with the Suez Canal, he could not see

any insuperable difficulty in overcoming the want of fresh water in the Desert of Tuzr.

The PRESIDENT said, when Sir Charles Napier won his great victory at Meeanee he sent Major Vickary from the edge of the Runn of Cutch across to the great chain of mountains, and he returned with a collection of fossils, which, for the first time, showed clearly the true structure of that prolongation of the Suliman range.

Seventh Meeting, 28th February, 1870.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*James Nisbet Robertson, Esq.; Arthur Laing, Esq.; F. F. Searle, Esq.; John Markham, Esq.*

ELECTIONS.—*Donald Butler, Esq.*, M.D.; *Commander G. M. Balfour*, R.N.; *William A. Morgan Browne, Esq.; William L. Barclay, Esq.*, R.A.; *Francis W. Buxton, Esq.*, R.A.; *E. F. Chapman, Esq.*, Lieutenant R.A.; *Colonel Dudley Carleton; R. Harvey Hilliard, Esq.*, M.D.; *R. Alexander Hankay, Esq.; William Morris James, Esq.; Colonel Charles E. Love; The Hon. Henry Littleton; John Markham, Esq.* (H.M. Consul at Chifu); *William Colpoys Midwinter, Esq.; Major-Gen. W. C. McLeod*, (Madras Army); *Lieut.-Colonel George W. Baikie; The Right Hon. Sir John Rose; W. Anthony Whyte, Esq.*

ACCESSIONS TO THE LIBRARY FROM 14TH TO 28TH FEBRUARY.—'Across Mexico in 1864-5.' By W. H. Bullock. Donor, the author. 'The Denver Pacific Railway.' By T. Collinson and W. A. Bell. Donors, the authors. 'Memoir sur le Tacuy de Barros.' By W. D. Cooley. Paris, 1869. Donor, the author. 'Path of the Total Phase of the Solar Eclipse, December 21–22, 1870.' By J. R. Hind. 'South Australia Illustrated.' 1847. By G. F. Angas. 'New Zealanders.' 1847. By the same author. Purchased. 'Mexico in 1861. By C. Lempriere. Purchased. 'South Australia, 1848.' By G. B. Wilkinson. Purchased. 'Village Life in Egypt.' By B. St. John. 1852. 'Travels in China, &c., 1853.' By W. Tyrone Power. 'Sardinia in 1849.' By J. W. Tyndale. Purchased. 'Six Years in India.' 1854. By Mrs. C. Mackenzie. 'Trade and Travel in the Far East.' 1846. By G. F. Davidson. Purchased. 'Afghanistan.' 1842. By J. Atkinson. Purchased.

The following paper was read by the author:—

A Visit to Yarkand and Kashgar. By R. B. SHAW, F.R.G.S.

[EXTRACTS.]

THE common idea of Tartary is, I think, that of a vast succession of plains, over which hordes of barbarians wander at will with their

cattle and tents. We are hardly prepared to hear of a well-cultivated country full of settled habitations, and containing flourishing cities of more than 100,000 inhabitants, where many of the arts of civilisation are carried on. Security of life and property exists; commerce is protected; light carts drawn by horses frequent the roads; markets are held on a fixed day of the week even in the smallest villages. In the towns extensive bazārs, covered in against the rays of the sun, contain rows of shops where goods of every sort and from every country are exhibited. In Yarkand alone there are sixty colleges, with endowments in land, for the education of students of Mussulman law and divinity, while every street contains a primary school attached to a mosque, where turbaned rows of young true believers may be seen and heard daily at their first lessons of reading and writing. Different quarters of the town are set apart for the sale of different wares. In one street will be found spread out the silks of China, in another the cotton goods and prints of Russia, while a third will contain the robes made up of both materials, three or four of which form the ordinary dress of the Turkis. Further on you meet with sugar from Russia, tea, spices, and all kinds of foreign produce. In another part are the butchers, who offer a choice of horse-flesh, camel, beef, or mutton. The first is rather a luxury, but the two last are most abundant, selling at about one penny a pound. Next are the bakers, who make most excellent light loaves by a process of steaming the bread. The sellers of country produce supply vegetables of many kinds; such as cabbage, turnip, lettuce, carrots, &c., besides cream, nearly as thick as that of Devonshire, also a peculiar preparation of curds, and delicious cream-cheeses. At another place you can get sherbet made of fruit, which you can cool at every street corner from stalls for the sale of ice, which has been pitted in the winter. There are tea-shops where the great urns are ever steaming, and eating-houses where business-men can get their midday pilao. Elsewhere are horse and cattle markets; in fact it would be impossible to enumerate all.

Such is the condition of this hitherto little-known nation, which, while Europe ignores its existence, is living a life of its own, making history very fast, and looking upon European politics with the same indifference with which its own have been regarded by us. But I must now say a few words regarding the shape and position of the country.

Eastern Turkistan (or, as it used to be called on our maps, Chinese Tartary) resembles a huge bay, with its mouth turned to the east, and shut in on every other side by gigantic chains of mountains. A broad desert, thirty days' journey in extent, occupies its

mouth, and separates it from China, of which empire it was, until recently, a possession. This desert sucks up all the rivers of Turkistan, which die away in marshes and lakes, or form a vast jungle of scrub-wood, where they disappear under the sand.

Both the northern range, which is a continuation of the Thian-Shan, and the southern, which may be called the Himalayan, converge towards one another as they run westward, and are united by a cross-range, supporting the high plateau of Pamir, which the Natives call the "Bâm-i-dunya," or "Upper Floor of the World."

This cross-range, however, is of irregular shape, and its northern half is thrown very much back, forming a kind of secondary bay, at the upper corner of the great bay, to which I have likened Eastern Turkistan. At the mouth of this inner bay stand the town of Yunghissar, and the city of Kâshgar, the political capital of the country, as Yarkand is its commercial capital. Two long arms are pushed out under the northern and southern ranges of mountains, between them and the great desert. These arms are formed by the province of Khoten, on the south, and those of Ush-Turfân, Aksu, Kuché, &c., on the north. Thus the inhabited country resembles a crescent in general form, its convex side guarded by mountains, and the concave occupied by desert. Its general elevation is 4000 or 5000 feet above the sea-level, while some of the peaks around rise to an altitude of more than 20,000 feet, as well as can be judged without actual measurement.

In talking of the northern and southern boundaries of Eastern Turkistan, we must remember that they are by no means simple ranges, like the Alps or the Pyrenees, which can be crossed by a single pass. They are rather complex systems of mountains, composed of many chains, and enclosing considerable countries within their valleys. Thibet and Cashmere are examples of this. Eleven high passes have to be crossed in travelling from India to Turkistan by the usual trade-route, and of these passes only two are lower than the summit of Mont Blanc.

The rivers rising in this part of the Himalaya have the peculiarity, that, instead of finding their way at once to the plains, they often run for several hundred miles in the longitudinal valleys between the chains and parallel to them, until, at last, they seem to muster strength to break out of their imprisonment and burst forth through some rent in the mountain-barrier that confined them. The most signal instance of this is the Indus, which, rising in Chinese territory, runs north-westward behind five ranges of the Himalayas until it reaches its turning-point, when it breaks through them all, and issues into the plains of India southward. In this vast

sweep it encloses the whole course of its five great tributaries, which give the Punjab its name. These each imitate its example in a less degree, and the gorges by which they cut through the chains exhibit the wildest scenery in the Himalaya. It is interesting to find this peculiarity repeated on the north of the great watershed. The Karakash River runs for 80 miles along the southern flank of the Kuen-lun Range, before it can escape through the Gorge of Shahdulla by a sudden turn. And the Yarkand River, rising near the Karakorum Pass, makes a great sweep behind another portion of the same Kuen-lun Range before turning towards Yarkand. It begins by running nearly west, and finishes by a long course eastward into the Takla-Makân Desert. It is this configuration of the country which forms the chief difficulty in crossing it; for it is found easier and shorter to take the trade-routes across all the ranges in succession, than to turn these ranges by following the devious course of any of the rivers which drain them.

The northern mountain boundary of Eastern Turkistan is almost equally complex, excepting towards its western end, where only a single wall of mountain is left between the Kashgar territories and the upper valleys of the River Jaxartes, whose lower course is now held by the Russians. Advancing on another line of operations, from Siberia, Russia has lately placed a fort in one of these upper valleys, called that of the Nareen. The intermediate portion of the Jaxartes is, therefore, all that now retains independence of the former khanate of Khokand.

You thus see that Eastern Turkistan is a very compact state, being cut off from all her neighbours by high mountains and immense deserts. The physical consequence of its position is that the region is almost rainless. All the clouds laden with rain from the Indian Ocean exhaust themselves on the outer ranges of the Himalaya, where in places the rainfall amounts to as much as 300 inches in a year; the second and third ranges get much less, and beyond that comes the region of sterility called Thibet. Here we see the phenomenon of the line of perpetual snow becoming *higher* as we advance northward, and even of its being, in certain parts, *lower* on the south side than on the north of the same range, according to a law announced by Dr. Thomson, in his 'Western Himalaya.' While the southern ranges are blocked annually with such masses of snow that the sun cannot fully melt them away till late in the spring, or rather summer, the more northern ranges in Ladak or Thibet receive a comparatively small sprinkling of snow in winter, which the intensely hot sun of those uplands can soon cope with. Thus the traffic is scarcely interrupted in Thibet at

elevations of 17,000 and 18,000 feet, while nearer India the passes of 11,000 and 12,000 feet are blocked for many months. It will easily be imagined that very little rain-cloud penetrates beyond Thibet again across the still higher ranges northward into Turkistan.

The other mountain boundaries form similar obstacles to the clouds on the north and west, while the enormous distance to the China Sea on the east acts as a bar in that direction. It actually takes two several river-systems to reach the sea from Eastern Turkistan: the first losing itself in the desert, while a second set rises in the eastern parts of China and runs through that country to the ocean.

Thus, although the first appearance of Central Asia, viewed from the crest of the Kuen-lun, recalls the aspect of the open plains of India which have been left behind, yet no sooner do we begin to descend towards it than we perceive a vital difference. Here no forests clothe the hill-sides, no verdure rejoices the eye tired of the perpetual glare of the naked gravel. The plain, where we first enter it, is as bare as the mountains we have left. It is, therefore, the more surprising to see the rich cultivation which the hand of man has produced on its surface. Once past the band of desert (varying from 10 to 20 miles in width) which slopes down from the foot of the mountains, the traveller enters a cultivated country, where in spring—as I saw it on my return—a broad sea of green wheat stretches right and left, running into little bays and arms between the scattered farmhouses and hamlets, each surrounded by its orchard in full blossom. So numerous are these orchards that they close the view a few hundred yards from the eye. The productions are nearly the same as those of Cashmere. Apples, pears, apricots, peaches, mulberries, walnuts, melons, and even grapes, grow to perfection (the vines being buried in winter on account of the frost); while the chief crops are wheat, barley, Indian corn, and lucerne, which two latter are the universal feed of the horses. Cotton, flax, and hemp are also much cultivated, though neither of the latter for their fibre.

The roads are often crowded with people. I left the town of Kargalik on the morning of the weekly market, which is held in every village and town of Turkistan. The country people were flocking in from all directions, bringing the produce of their farms for sale. There was hardly one of all the multitude that was not mounted, even though it were upon a donkey. Rosy-cheeked farmers' wives and daughters, sometimes two on a horse, or mounted behind their husbands or fathers, and carrying their

baskets of eggs or of butter: boys driving their files of donkeys, and always riding on the hindmost; farm-servants, taking in horses or cows for sale; merchants, with bales of goods; covered carts, with one horse in the shafts and two or three abreast as leaders; beggars with their tall caps, and calabash by their side (even they often beg on horseback!); all these poured past us in a continuous stream for several miles. Then the crowd on the road began to get less dense, but we could still see parties of people in single file converging along bye-paths towards the road. Now, all this population is supported on land which but for artificial watering would be a bare desert. The country is a perfect network of canals, great and small. Many of the rivers are absolutely drained of their water for the benefit of the thirsty fields, even before reaching the great Desert, which would, at any rate, engulf them. I have often seen three several channels of water crossing one another at different levels. Canals are the life of the country, and are felt to be so important that even the ruler himself, Yakoob Beg, was, during my stay at Kashgar, engaged personally in the construction of one. He used to visit it daily, working often with his own hands at the excavation, to encourage his soldiers who were employed at the work. His care is not confined to canals; new roads are being made and bridges erected by his orders; rest-houses for travellers and wells in the desert are being constructed. At the same time he propitiates the religious classes of his subjects by a strict enforcement of the laws of Islâm, and by the building and endowment of colleges and mosques.

Such is the ruler who now governs Eastern Turkistan. I may briefly remind you how he obtained possession. Up to within five or six years ago the Chinese held the country. They had dispossessed the native Musselman rulers, a family called "Toorra," who claim descent from the conqueror Jenghis Khan. After repeated attempts to recover their lost sovereignty, the Toorras made a last and more successful incursion in 1864, assisted by an auxiliary force of Andijanis from the neighbouring kingdom of Khokan, who were headed by Yakoob Beg. The occasion was favourable, for a mutiny had occurred among the mercenary troops of the Chinese. The invasion of the Toorras was successful, but its fruits were gathered by Yakoob Beg, the leader of the auxiliaries, who has since then exiled and otherwise disposed of the chiefs of the Toorra family. His followers, the Andijanis, now occupy the chief places in the administration, and form the strength of his army. Originally few in number, their ranks have been swollen by thousands who have fled from their homes before the advance of the

Russians; but their attitude towards the native Yarkandis is very conciliatory, and, on the whole, they are looked upon not in the light of conquerors, but as brothers in faith and in blood who have delivered them from the yoke of the unbelievers and idolaters. The disposition of the Yarkandis leads them to commerce and the arts of peace, while the Uzbeks of Andijan find their most congenial occupation in administration and soldiering. Both nations talk the same language, with merely provincial variations, and it is essentially the same as the Turkish of Constantinople.

The official classes generally live outside the towns in a kind of fortified cantonment, originally built by the Chinese for their own protection. There is one of these fortresses near every large city, and they all go by the name of Yungshahr, or "New-town." The dwelling-houses of the upper classes contain two or three courtyards, surrounded by rooms, of which the doors open on to a carpeted verandah. The inner court is generally assigned to the women; the outer one often contains a kind of open pavilion, where the master of the house receives the visits of his acquaintance. If it is winter, the visitor is taken into a room, of which the floor is covered with soft Bokhára or Khoten carpets, while a bright wood-fire burns in the open fire-place.

The amount of etiquette observed at such visits is considerable. At my first introduction to the Governor of Yarkand, who is the Vizier of the kingdom, and who afterwards became my firm friend, he advanced to meet me with outspread arms. The embrace consists in clasping the other man round the body, and placing your chin on his shoulder, while he does the same to you. In this position you pour forth a long string of complimentary phrases without listening to those of your friend. This completed, I am led to the fire, on each side of which a cushion is placed. No sooner have I sat down on one of these, than, according to custom, I rise again to enquire after my host's distinguished health. This obliges him to rise too, and reply in the stereotyped form, that, "Thanks be to God, it is well." After a few minutes' conversation a servant is summoned, who enters, carrying a silk table-cloth, and followed by a procession of others bearing fruit of all kinds, bread and preserves in china bowls and on trays. The cloth is spread between the host and the visitor, and tea is poured out in small china cups for each. The master of the house then breaks off a small piece of bread, which he places before his guest. This the latter is bound to taste, as a sign that he accepts the hospitality. But, as he does so, he says "Bismilla," "In the name of God." Finally the cloth is removed, and I carefully pick up and replace

any crumb of bread that may have fallen from it. To allow the least crumb to remain on the ground is looked upon as most irreligious neglect. When the cloth is removed, another servant brings in a silk robe of honour, which is placed over the visitor's shoulders, and the master of the house then conducts him out by another door to a distance varying with their relative ranks.

My friend Mohammud Yoonas was originally a Persian writer in the service of the Khan of Khokand. This Chief having occasion to write a letter to the King of Bokhara, employed Mohammud Yoonas to do so. This letter proved to be so full of Arabic terms and high-flown expressions, that when it reached Bokhara there was not a savant in that learned city who could read it. This was the foundation of Mohammud Yoonas's fortune. He was immediately promoted to be Chief Secretary of the Khan of Khokand, and eventually came over into Eastern Turkistan, when he was made Governor of Yarkand by the present ruler Yakoob Beg.

This Chief is certainly a fine fellow, and no one can come into contact with Yakoob Beg without recognizing his remarkable character. I have before mentioned his energy in all matters affecting the progress of the country. His mastery of it is a standing miracle. Six years ago he was a petty Governor of a town in Khokand, threatened by the Russians, with whom he had already had many fights, and in disgrace with his own ruler, being the adherent of a rival to the throne. In six years he has become absolute despot of a country two or three times the extent of Great Britain, and of the most unruly people in Central Asia. It used to be a common saying in that region, that never a year elapsed without a rising in Kashgar. The Chinese maintained a large force near that city, which had to be reinforced periodically from Pekin. But since Yakoob Beg has been master, not a soul dares stir. Of course he has obtained this power partly by terror, and by what we should call barbarous executions. But it is wonderful that with him this terrorism should never have become a habit, as with most Oriental despots. Yakoob Beg has drawn the line exactly at the point where severity ceased to be a necessity of his position. He has produced perfect order and security, without alienating the mass of his subjects. They feel that these exhibitions of force are, as a rule, exerted on their side and in their interests. He sits every day in the gateway of Kashgar for two or three hours to hear complaints; and it is a common occurrence for some old woman or countryman with a grievance to use reproaches and strong language in stating their case, at which he only smiles. He thus cultivates the affections of the people, the priesthood, and the

army, to whom he is prodigal of gifts. But the gallows are a great institution in the country, and the great gateway of Kashgar, of which I could see the top from my house, was frequently the scene of executions.

My first presentation to him was rather an effective scene. I was preceded by men carrying my presents on trays. After them came a troop of long-robed ushers with white wands, then two officers of high rank, who had come as a deputation to fetch me. Dressed in the costume of the country, I followed them with my Persian writer and servants. A long avenue was formed up to the palace by soldiers, who kept back the people. Three or four pieces of artillery stood on either side of the gateway. The large quadrangle into which we then entered was lined with rows upon rows of guards, dressed in the brightest coloured robes, and sitting in solemn silence with their eyes cast on the ground and their hands folded in front of them. A second quadrangle presented the same spectacle; but the robes were richer than before, and the men seemed of higher rank. The stillness of these numbers (there were nearly 3000 we calculated), the regularity of their order, and the brightness of their clothing, produced a most striking effect. At the entrance of an inner quadrangle all my servants were stopped, even my Persian writer, on whom I had counted to interpret for me. Preceded by one official, I crossed this silent and almost empty court towards a long pavilion at the end. After pointing to a door, my guide disappeared. I entered, and saw, at the further end of a long room, a man sitting alone near a window. When I approached him he put out his hands to greet me, smiling pleasantly, and pulled my robe to make me sit down on a cushion opposite him. Yakoob Beg is a man of about forty-five, short and stoutly built, with a very broad forehead. After the first salutations, we kept silence for a minute or two. Then he commenced again with a remark about the weather. I answered, and asked for an interpreter; but he laughed, and said he could understand me quite well enough, and that between friends no third person was required. He then bid me welcome to his country as the first Englishman that had ever been there, and said that God put it into his heart to accept my arrival as a favourable omen to himself.

I had several conversations with him afterwards, in all of which he expressed his great desire to be friends with the English. He often repeated: "Your Queen is like the sun, which warms every thing it shines upon. I am in the cold, and desire that some of its rays should fall upon me. I am very small (showing the tip of his finger), a man of yesterday. In these few years God has given me

this great country. I am very glad that you have come. Whatever services I can render you here, you may command, and you must do the same for me. Come, what account will you give of me in your own country, when you get back?" This he said, laughing. I replied: "I shall say that what had already been heard of you was not half of what I found the reality to be." He laughed again, and stretched out his hand to shake mine.

At our last interview he took quite an affectionate farewell, taking my hand in both of his, and holding it while he wished me a safe return home, putting me under God's care. Then, with outspread hands, as their manner is, he repeated a prayer in Arabic for my safety and success, drawing his hands over his face and down to the tip of his beard afterwards, saying, "Allaho Akber," "God is great."

On previous occasions he expressed himself as very anxious to encourage trade between India and Turkistan, and to establish intercourse between the Governments. His acts, however, are of more value than his words in this respect, and completely bear them out. Merchants from India are beginning to frequent Yarkand, and it only requires the removal of a few obstacles which exist in the hill countries subject to our own influence, to open out a field for trade of which it would be difficult to over-rate the importance. The Russian estimates of the population to which Yarkand is the door of access vary between 20 and 60 millions. Russian manufactures are taking possession of the field, notwithstanding the fact that the transport of goods from England to Yarkand costs 13s. a cwt. less than from Moscow to Yarkand. The Russian tea-merchants send tea from China through Siberia into Central Asia, over a road 4000 miles in length, although our tea plantations in India are only 700 miles from the tea-market of Yarkand. It need not be supposed that the consumption of Central Asia is small. Every man of these millions wears at least two, and often five or six, large robes made out of, or at least lined with, printed cotton. They would certainly consume more calico in a year than the same number of average Europeans. As for tea, they never leave off drinking it, although the ordinary quality costs as much as 10s. a pound. I have seen a group of soldiers sitting round their camp, adding fresh boiling water to their exhausted tea-pot, until almost every vestige of colour had disappeared from the decoction. They *must* have their tea, though it be only in name. One of themselves, describing their love for it, said that unless you finished a whole tea-pot full before sunrise, you were not considered a man in Yarkand; and that, as a rule, every one took his share in at least

ten in the day. The annual consumption in the Governor of Yarkand's household, including guards and dependents, was said to be 3000 tillahs' worth, equal to 1800*l.* sterling.

In great contrast to their friendly behaviour, and to the really excessive amount of attention and honour which they bestowed on me, was the close confinement to which we were subjected while in the cities. Even my friend Mr. Hayward, who entered the country a short time after me, was not allowed to visit me, nor did we meet until we were on our return. They used no force, nor show of force, to me; but, as they themselves expressed it, "The chains of wisdom are better than those of iron." My servants, on the other hand, were free to come and go as they would. It is undoubtedly a great step in advance for Englishmen to have lived six months in safety and honour in the heart of Central Asia, but I trust the day will come before long when they will be able to traverse it as freely as they do Europe. The absence of any ill result from the visit of the first Englishman, now the barrier is once broken, will, I hope, produce this result. The nightmare of Central Asiatic rulers, and the cause of nearly all the ill-treatment which European travellers have experienced, is the dread of their being spies. By some magic the explorer is supposed to carry off a plan of the roads, and by those roads a European army follows. Of course there is some truth in this view, and the great secret of success is to have a distinct object, which will be sufficient, judged by an Asiatic standard, to account for your proceedings.

After parting from Yakoob Beg at Kashgar, I returned to Yarkand, when I was further detained until the roads should be quite free from snow. At last, on the 30th of May, we started, and for some part of the way I had the pleasure of talking English again, and comparing notes with Mr. Hayward regarding the treatment which we had experienced. Further on, however, we again separated, in order to explore different roads. I returned by the Karakorum Pass, which is the ordinary trade-route. I wished to compare it with the new route by Chang Chenmo, which I had taken in going.

The first range of mountains which has to be crossed is the Kuen-lun. This, although we call it by a Chinese name which no native of Turkistan has ever heard of, is in reality a portion of the Himalayan system of mountains. The other ranges of which the Himalaya consist are as much and as little separated from one another as this is from the rest. In shape you must imagine it to be like a letter Y laid on its side, or rather like a spur of which the rowel points west. Inside the opening of the spur is the heel of

the boot, a huge mountain mass, and in the narrow space between the heel and the spur runs the River Karakash, making a complete curve in its escape through the mountains. We begin by crossing one branch of the spur by a pass of over 17,000 feet, and this brings us into the gorge of the Karakash. We follow this gorge round its curve, by which means we avoid crossing the great heel. Another pass of greater height takes us out of the Karakash Gorge and across the other branch of the spur. The scene which here meets us is extraordinary. The ground we stand on is over 16,000 feet above the sea. In front of us and to our left stretches a wide undulating plain of bare gravel. Looking across it, twenty-five miles off, is a row of apparently isolated snow-mountains divided by ravines. They are the bluff terminations of immense parallel ridges of which we can only see the ends, these ridges being the mountains about the Karakorum Pass. Turning back we see the Kuen-lun like a huge wall. One is an army in line; the other an army in parallel columns, of which we can only see the heads. To the east and the west we have even greater contrasts. Eastward the gravelly plateau stretches till it is terminated by some high rolling downs covered with snow. Westward a few water-courses from in front of us form into a ravine which deepens gradually, plunging down a blue abyss that is lost to view amid the tremendous convulsions of the mountains around. This is the Yarkand River. The clearness of the atmosphere is indescribable. Everywhere the snow descends nearly to the level of the plain, and nowhere is there a blade of grass, or any other sign of vegetable or animal life. Each halting-place is a perfect charnel-house of dead horses, which would be preserved almost unchanged by the dryness of the climate if it were not for the wolves which we hear howling in packs every night.

It would take too long if I were to describe minutely the remainder of the journey back. We were drenched in ice-cold streams, nearly swallowed up by quick-sands in their midst, stopped by glaciers which had dammed them up, obliged to abandon all our baggage for a time and sleep wrapped in a blanket on the least windy side of large stones. We floundered through large plains of snow, in which we periodically sank up to the thigh.

This will give you an idea of the difficulties which merchants undergo on the route now in use. A few of them have lately struck out a new route more to the east, by the Valley of Chang Chenmo, of which it is sufficient to say that it nowhere crosses either perpetual snow or difficult rivers, the great perils of the present road. It is also a much more direct route to British India, to which they

are bound, and they object to going a longer and more difficult way merely in order to pass through the town of Ladák and be taxed by our tributary the Maharaja of Cashmere. But the officials of the latter (unsanctioned, I believe, by their master) see things in a different light, and our Indian teas and Manchester cotton goods may possibly have to pass through water and snow for years to come on their way to Central Asia.

The PRESIDENT, in returning thanks to Mr. Shaw for his paper, said that he was the first Englishman who had visited Yarkand and returned to give an account of the interior of the country and the manners of the inhabitants.

Sir H. RAWLINSON said the great practical value of Mr. Shaw's explorations in Eastern Turkistan was, that they had been the means of opening out an extensive market for British trade and manufactures, a market which was really almost boundless, and which in the future may be of the very utmost importance. The Government of India had regarded the discoveries of Mr. Shaw and Mr. Hayward of such importance, that negotiations had been entered into with the Maharaja of Cashmere, for the purpose of fostering trade, and these negotiations had resulted in an arrangement by which all transit duties through Ladak would be abolished, and officers would be appointed as joint commissioners by the two Governments to facilitate traffic in every possible way. At present, from the vicinity of Iindok to Shadula there was positively not a single inhabited dwelling, and, therefore, the object of the negotiations must be to erect stations for supplies on the road, and to give facilities for the owners of baggage and cattle. It was also to be hoped that security would be attended to. At present, whether travelling by the Karakorum Range, or through the Chang Chenmo, traders are obliged, after leaving the Karakash River, to cross the Sanju Pass, which was extremely bad for cattle. So long as the communication between Thibet and Eastern Turkistan was confined to that route, there never could be any very great and profitable traffic. Mr. Hayward had, however, discovered that the Yangi Pass, a little further to the westward, was quite practicable, and the only thing required to render it available for commerce was the erection of a fort to keep it safe from the attacks of robbers. The erection of that fort must depend on the friendly feelings of the Cashmere Government, and it was a great matter that the Indian Government should have succeeded so far as to render the establishment of such a defence a matter of great probability. He had that day received information from India of the publication of the results of two most remarkable and valuable journeys in these countries by Major Montgomerie's emissaries. One of them, Mirza Sujah, was at Cashmere when Mr. Shaw and Mr. Hayward were there. Mirza Sujah came from Herat in 1840. He had been educated in India, and was now an accomplished surveyor. Having travelled through Affghanistan in perfect safety, he had subsequently made one of the journeys which had always been considered among the great desiderata of Central Asiatic geography. He had passed across from Beluchistan to the Oxus, and from thence had followed Lieutenant's Wood's route to the sources of that river. He had verified Lieutenant Wood's statement of the existence of Lake Karakul, about which there had been considerable doubts. On his arrival at Tashkurgan he was arrested by the officers of Yakoob Beg, who took him to Kashgar, following the very route formerly taken by Marco Polo. This was not the exact course which Mr. Hayward proposed to follow. His intention was to go up the Gilgit River across the mountains, and so on to the Pamir. Another of Major Montgomerie's pundits had also explored what had hitherto been a sort of terra

incognita to Europeans. He had crossed from the Indian frontier fairly into the central desert, and had proved that from Rudok right away to the Wall of China there were no high mountains. Thus, after leaving the Pangkong Lake, a four-in-hand might be driven to Kashgar. For many years past a road from the plains of India across the Himalaya had been contemplated, and only 50 miles remained to be finished, in order to have a fair open road into Eastern Turkistan. The only difficulty in the way of carrying out such a scheme arose from Chinese exclusiveness, as this plain was in Chinese territory. However, in due course of time, it was to be hoped that this natural route would be opened up.

Mr. T. SAUNDERS thought the author of the paper had erred with respect to the physical geography of the district he had travelled through, in supposing that the Himalayas and the Kuen-lun Mountains were to be regarded as one system. The mass of mountains to the north of India was upwards of 2000 miles in length, by 600 in breadth. It descended by steep slopes on all sides, by the Himalayas to the plains of India on the south, and by the Kuen-lun Mountains to the great desert of Gobi on the north. On the east it descended by equally steep slopes to the Plains of China, and starting from that base the two ranges, the Kuen-lun and the Himalaya, met together as in an apex at the great mountain knot of Pusht-i-Khar, where they join the Hindoo Koosh Range. But eastward they were 600 miles apart, and he thought it was not to the advantage of systematic geography to consider as one range the whole extent of so vast a mass. It was far more convenient that the great range of the north should have its distinct designation, as well as the great range on the south. He had no doubt that the range on the north was as well defined on its interior base as the Himalayas. It was, therefore, correct to say that this vast mass was bounded by a great range on the south, a great range on the east, and a great range on the north.

Mr. SHAW said his reason for regarding the Kuen-lun Mountains and the Himalayas as belonging to one system was, that the elevated belt of country over which he had travelled consisted of no fewer than eleven ridges, more or less parallel, separated by depressions, and he could not see why the last of those parallel ranges should be considered a distinct system any more than any of the other ranges.

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2. *Notes on a Journey through Shantung.* By J. MARKHAM, H.M. Consul at Chefoo.

[EXTRACTS.]

UNTIL very recently the province of Shantung, in the north of China, has been a closed book to the civilised world; but now, owing to the travels and researches of the Rev. Alexander Williamson, this rich and most interesting country is better known. As however, I considered that there was yet a vast amount of information to be gained, I made a tour of the province in the early part of 1869, visiting the principal cities, sea-ports, harbours, and silk-growing districts, and had the honour of reporting thereon to Her Majesty's Government; there were, however, many subjects of interest not embodied in my official Report, and which this Society may deem worthy of notice.

Leaving my post at Chefoo—the sea-port opened to foreign trade—on the 24th of February, 1869, I took a south-east course, passing through the Tsehya Valley, a district in which the ailanthus silk (*Saturnia Cynthia*) is largely cultivated. This district is mountainous, but the valleys are most fertile, producing cereals of nearly every description, and also some cotton.

On the 6th of March I reached the large and important city of Wei-hsien, my route being over what had once been a carefully-constructed Imperial road, but which is now in utter decay and nearly impassable in wet weather. It leads through an undulating and highly-cultivated plain, studded with numerous villages and prettily wooded. Some 20 li s.s.w. of Wei-hsien are extensive coal-fields; they lie in the plain, with hills to the south and west about 6 miles off. A great number of pits have been opened, but only ten are now being worked. These pits or shafts are from 15 to 30 feet deep; the miners work on until the water rises over the seam, when the pit is abandoned for another, their only means of getting the water out being by large skin buckets, holding three gallons each, which are hauled up by a huge windlass; hence it is probable that the finest quality of coal is missed. The whole district is honeycombed with old workings. The Wei-hsien coal is principally anthracite, burns bright and clear with scarcely any ash, and throws out a great heat. The price of the coal, at the pit's mouth, is about 4*d.* for 130 lbs. The cost of conveying this coal to the city is from 125 to 200 cash a picul, or say from 8*d.* to 10*d.* for 130 lbs., the means of transport being carts, drawn by from three to six mules, wheelbarrows, and donkeys.

Leaving the valley, I once more took the high road, and travelled towards the capital of the province, Tsi-nan-foo, which I reached on the 15th of March. It is in lat. 36° 50′, long. 117°, a large and important city, enclosed by high walls in excellent repair.

From Tsi-nan-foo I took the Imperial high road from Nanking to Peking, and travelled on it south, along the foot of the Tae-shan range, to the city of Tae-nyan-foo, distant 160 li from Penanfoo. I noticed that both hemp and tobacco were largely cultivated. The scenery here is very beautiful; I passed through a lovely valley, with the Tae-shan on the left.

Tae-nyan-foo is a walled city, situated at the foot of the Tae-shan, the Sacred Mountain of China, and the highest of the range bearing that name, which stretches between Tsi-nan-foo and this city. In the north part of the city is a magnificent temple, dedicated to the mountain, which occupies the greater part of the north of the city. This building is situated in a fine park of

25 acres. Some of the trees, composed principally of yews, cedars, and cypress, are of very great age, having been planted by emperors of the Sung, Yüan, and Ming dynasties, 960-1628 A.D. The main temple is a large hall, 120 feet long by 50 feet broad. It contains, facing the entrance, a huge statue, representing the Emperor Shun, sitting enthroned in a massive chair. Shun is said to have dedicated the Tae-shan to the God of Heaven, and sacrificed thereon a burnt-offering to the Supreme Ruler, during his first tour through the empire, when acting as Viceroy for Jaou, in the seventy-sixth year of that Emperor's reign: this would be B.C. 2281. Shun succeeded Jaou in the year 2255 B.C. The walls of this magnificent temple are covered with a panoramic painting, really well executed, representing an Imperial procession. White elephants, camels, and other animals, fabulous and real, are depicted. The painting commences on the east side-wall, and continues round along the north, or back-wall, finishing on the west wall.

From the temple I made the ascent of the mountain by a road 12 miles in length, consisting of a succession of flights of steps. It commences outside the north gate, and leads up a gorge, at first with a gentle ascent, but it gets gradually greater, until at last it approaches the vertical and becomes most laborious. The road for the first 2000 feet is lined with handsome cedar and yew trees, but beyond this altitude, for the next 3000 feet, these are replaced by the common flat-topped fir. Numerous small temples are erected on either side all the way, and tablets put up by various emperors, viceroys, and other high personages, occur frequently; some of them are of very ancient date, the characters being nearly obliterated by time and the number of rubbings taken from them.

The summit, called the Yu-hwang Shang-ti, is 5000 feet above the temple at the foot of the hill. Since Shun dedicated this Tae-shan to the true God, it has been held as the sacred worshipping-place of the emperors of each dynasty. All the temples of the Tae-shan are Taouist, and the priests the most dirty, degraded-looking creatures imaginable, dressed in a dirty robe of coarse yellow cloth. The view from the summit of the Tae-shan is most grand. To the north-east and north-west you look down upon range after range of mountains, and to the south-east and south-west the plain in which the city of Tae-nyan is situated is mapped out; in the distance are other cities; and away to the south-east the River Ta-wan Ho is visible, winding its way amidst groves of fine timber.

On the 23rd of March I reached the city of Confucius, Kio-fu-hsien. This city is chiefly inhabited by the descendants of the great

sage, eight out of ten families bearing his surname. The magistrate's office is hereditary in the family. The city is walled, and differs in no wise from other Chinese towns except that, besides the usual four gates, it has a second south gate, which is only opened to an Imperial visitor. This gate is in front of the Temple of Confucius, and leads directly to it, which, together with the ducal palace of the sage's descendants, occupies the greater portion of the north and west of the city. Both edifices are situated in magnificently-wooded grounds, those of the temple covering some 35 acres. The temple is in the west, and the chief part of it stands on the spot where Confucius lived. The plan of the temple is somewhat similar to other buildings of this class in China, but on a far grander and more superb scale, and I have never seen anything to compare with it in any part of China. On arriving at the inn I sent my card to the representative of the family, intimating a desire to see him; but I confess I little expected that honour, considering the treatment I had received throughout my journey at the hands of the mandarins. To my surprise and gratification, however, I received a reply that the Duke would see me with pleasure, and I therefore proceeded to the palace, where, on entering the large gates, I was met by a high official, and proceeded with him, down the avenue and through several courtyards lined with handsomely-dressed retainers, to the gate of the inner palace, where the Duke, with several members of his family, awaited me. After the customary greetings, the Duke ushered me into the reception-room, but not pausing, conducted me into his private study, where he invited me to be seated. This study was a small room, the walls lined with books on shelves; here many relics of the sage were pointed out to me, such as bronze urns, tripods, censers, and ancient manuscripts. I was particularly impressed with the Duke's manner, which was pleasing and gentlemanlike. He is about twenty-two years of age, slightly deformed, and not more than 4 feet 8 inches in height; his countenance, however, is most pleasing and intelligent. His title is Kung Yeh, equivalent to that of Duke in England. He receives a large pension from the Government, and ranks immediately after princes of the blood. A viceroy, on coming into his presence, has to make the nine kowtows or bows to the ground. His manner was entirely free from reserve, and he seemed most desirous of information, as were also his immediate attendants, who were all connected with him by blood in some degree. On leaving, the Duke accompanied me as far as the outer gate, and expressed his gratification at having made the acquaintance of foreigners, none having visited him before. On my

return to the inn, shortly after the interview, I found that a high officer had been sent by the Duke to inform me that the gates of the temple would be opened for me. This was a mark of great favour, as the day being the anniversary of the death of one of the representatives of Confucius, the temple was closed. We accordingly proceeded to this splendid edifice, accompanied by several members of the Duke's family. The grounds are very spacious and well wooded, and enclosed by high walls. They contain numerous temples, pavilions, and tablets of every date. The main temple is in an oblong enclosure, and is twelve halls deep, each hall having a square to itself, shut off by massive gates; these squares are full of magnificent tall old cypress-trees, and the sides of the avenue are crowded with tablets in honour of the sage. Every dynasty is represented, therefore many of these tablets are of vast interest and importance.

On the left of the entrance stands a cypress, or rather the trunk of one, said to have been planted by Confucius himself, and certainly its gnarled trunk testifies great age. Close to this is the place where Confucius taught, marked by a large pavilion, wherein, on a marble tablet, is engraved a poem in praise of the sage, composed by the Emperor Kiang-loong (A.D. 1736). The great hall lies third from the entrance, it is two stories in height, 100 feet long and 88 feet broad; the upper verandah is supported by thirty-four pillars of white marble 25 feet high and 3 feet in diameter, each one solid block, those in front white and most elaborately carved with the traditional dragons chasing the fly, and those at the sides alternate black and white veined marble. The tiles of the roof are of yellow and green porcelain, the eaves beautifully carved and painted, as is all the woodwork. Within this building is a statue of Confucius in a sitting posture, about 12 feet in height. It represents a strong thick-set man with a fine full face and large head, he is attired in yellow silk handsomely embroidered, and has a square college cap on his head with strings of beads falling in front and behind to a level with the neck. The seat is a throne raised some 6 feet from the ground, and surrounded by yellow satin curtains magnificently embroidered in blue and gold. The statue is in the attitude of contemplation, the eyes looking upwards, the hands hold a scroll, a slip of bamboo, which in those days was used for paper. On a tablet over the statue is the inscription, "The most Holy prescient Sage Confucius, his spirit's resting-place," while from the ceiling are suspended other tablets to his honour, all in extravagant praise. In front of the statue is a high table containing relics of the sage and presents made by different Emperors to the family—

amongst them a bronze censer, bearing on the lid the date of the Shang Dynasty, B.C. 1700; some magnificent enamels, such as are not seen in the present day; also a rosewood table of very solid make, which I was told was used by the sage himself—on closer inspection, signs of its great age were apparent, but it is in excellent preservation; likewise a clay dish, said to be of the Emperor Yaou's time, B.C. 2300, and two bronze elephants, dating from the Chow Dynasty, B.C. 1122—235.

In the second hall from the entrance are four marble tablets erected by Kiang-hi, A.D. 1622, with characters signifying "The Teacher of 10,000 ages." In this hall is a marble slab with an engraving of Confucius, said to have been taken during his life-time, and to be an excellent likeness; also two other engravings, but of more modern date. The engraving first alluded to is nearly obliterated by age and from the number of rubbings taken from it; the other two represent the sage at different periods of his life, and are perfectly distinct. I obtained rubbings of all three. Here are also 120 marble slabs let into the wall all round the hall; each slab has an engraving representing some scene, and the whole forms an illustrated life of Confucius, with explanations at the side. These were most interesting, for, apart from their great antiquity, they gave an idea of the houses, carriages, dress, and furniture, of that period. I obtained rubbings of all these, but I regret to say that I left them all in China. The other halls are erected in honour of Confucius' father, mother, wife, son, grandson, and some of his favourite disciples; each contains a tablet setting forth the names and titles of the individual to whom it is dedicated. Confucius' father was a man of note in the empire, he governed the cities of Yenchow-foo and Tsou-hsien. To the east of the temple is a huge slab of black marble, some 25 feet in height, on which is engraved the genealogical tree of the family down to the present generation; near it is a well from which the sage drank. The grounds of the Confucian Temple are full of objects of the utmost interest to the antiquary. Tablets of every age are erected throughout. The temple has been renovated within the last six years, and is now resplendent in paint and gilding. The ceilings are really grand, the blue and gilt dragons which adorn them being masterpieces of carving. The balustrades of verandahs to the temple, and the steps leading up to it, are of pure white marble, and exquisitely carved.

As an instance of the respect and veneration in which the great sage Confucius is held by the Chinese of all classes, I may mention that when the rebels occupied Shantung, and were devastating the country around Kiu-fou, they approached the city, and, on being

asked if they would destroy the temple of the great sage, they replied that all they wanted was to kill the unjust mandarins, and, on being informed that Kiu-fou was governed by mandarins of the Confucian family, they at once departed, doing no damage whatever even to the cemetery, although thousands of the country people had taken refuge within the sacred precincts. They entered the grounds, certainly, and it is said murdered numbers of the refugees, but they carefully abstained from damaging the tombs therein.

The products of Shantung are various; besides coal, iron, and gold, it contains silver, lead, and other minerals, while quarries of fine marble and granite also occur. Limestone predominates, but slate is very common all over the province. Clays of different sorts, suitable for making porcelain and other kinds of pottery, are abundant. Silk is very largely cultivated (much more so than is generally supposed), and fabrics therefrom, of very superior quality, are manufactured in many of the cities. Hemp, tobacco, pulse, fruits, and nearly every description of cereals, are extensively grown.

Travelling throughout Shantung is on the whole cheap, and far from unpleasant. My experience teaches me that a foreigner, so long as he behaves himself, can travel through most of the provinces of China with perfect safety, so far as the people are concerned. I feel perfectly satisfied that they will never of their own accord molest him in any way so long as he conducts himself properly towards them. The only danger a foreigner has to apprehend is from the mandarins, who are so inimical to us that they frequently set on the people to commit acts they would not dream of otherwise. During the whole of my journey, extending over six weeks, I met with the greatest possible civility and kindness from the middle and lower classes, and with the utmost rudeness and contempt from the mandarins, although I was armed with an official passport and a special letter to the governors of some of the principal cities. The exception was the manner in which the representative of Confucius received me: but it must be remembered that he is not one of the ruling mandarins, only an independent noble.

This paper will be printed entire, with map, in the 'Journal,' vol. xl.

The PRESIDENT said persons who were not acquainted with the geological structure of China, could have no conception of the importance of the discoveries of coal that had been made of late. The natives made comparatively little use of the great mines of coal in their country, their communication being carried on principally by water. The coal was the old and good coal. He anticipated that the time would come when great railroads would be formed

in China, and when proper use would be made of this combustible, which they possessed in such immense quantities.

Mr. W. Lockhart, after speaking of the reverence with which Confucius was regarded in China, said he had seen similar tablets to those described in the paper, in Peking, some of them undoubtedly dating from before the time of Confucius. The whole of the plain of Peking was certainly a great coal formation, spreading from the sea as far as to the Western Mountains. The quality of the coal was equal to that of the South Wales and Newcastle coal. When steam machinery was brought to bear on those coal beds, there would not only be a sufficient supply for our Indian steamers, but probably Chinese coal would be brought to England, as now English coal was taken to the coast of China for our steamers there.

Mr. J. Markham said the whole of the valley through which he had travelled was covered with pyramids of coal, and his journey was impeded by the traffic of carts laden with coal.

Admiral Sir William Hall said, on one occasion when coal was 10*l.* a ton on the coast of China, he captured a large convoy of Chinese colliers. It was very desirable that those mines of coal in China should be worked, so as to supply the vessels sailing those seas. After the capture of Nankin he saw immense piles of coal along the wharfs.

Eighth Meeting, 14th March, 1870.

Sir RODERICK I. MURCHISON, Bart., K.C.B., President, in the Chair.

Presentations.—*Lewis Alford, Esq.; Peter Turner Wills, Esq.*

Elections.—*Charles Ashton, Esq.; William James Anderson, Esq.; Lewis Alford, Esq.; Charles Fairbridge, Esq.; Charles W. Gray, Esq.; Edward Gellatly, Esq.; James G. Gibson, Esq.; T. Douglas-Murray, Esq.; Rev. W. R. Tilson-Marsh, M.A.; M. the Chevalier de Overbeck; Robert Turtle Pigott, Esq.; Albert Walker, Esq.; Thomas Watson, Esq.; Peter Turner Wills, Esq.*

Accessions to Library from February 28th to March 14th.—'Letters from Egypt.' By Lady Duff Gordon. 1865. 'Pilgrimage to Harran.' By Mrs. Beke. 1865. 'Wild Tribes of Khondistan.' By Major Campbell. 1865. 'Life with the Esquimaux.' Captain Hall. 1864. 'Ionian Islands,' &c. By E. Giffard. 1837. 'Tropical Australia.' By Colonel Mitchell. 1848. 'Cotton Kingdom, U.S.' By Olmsted. 2 vols. 1861. 'Pekin and the Pekinese.' By Dr. Rennie. 2 vols. 1865. 'River Plate States.' By W. Latham. 1868. 'The Argentine Alps.' By H. C. R. Johnson. 1868. 'South Australia.' By W. H. Leigh. 1839. 'Manners and Customs of the Japanese,' from Siebold. 1841. 'Travels in Canada.' By Kohl. 1861. 'Prehistoric Man.' By Dr. Wilson. 1862. 'The Native Races of Russia.' By R. G. Latham. 1854. 'A Classical

Tour.' By E. Dodwell. 1819. 'Venezuela.' By E. B. Eastwick. 1864. 'North Africa.' By J. Ormsby. 1864. 'Morocco and Algiers.' By Colonel Scott. 1842. 'The Orkneys.' By D. Gorrie. 1868. 'Visit to America.' By W. Chambers. 1854. 'Celt, Roman, and Saxon.' By T. Wright. 1861. 'Transylvania.' By C. Boner. 1865. 'Nicaragua,' &c. By F. Boyle. 1868. 'Voyages en Orient.' Par Ancher-Eloy. 2 vols. 1830. 'Voyage à la Guinée.' Par J. H. Van Bastiaanse. 1853. 'St. Helena.' By T. H. Brooks. 1828. 'Recherches géographiques sur Dieuil.' Par A. Letronne. 1814. 'L'Ile Madagascar.' Par Flacourt. 1658. 'Constantinople.' By Grelot. 1780. 'Kamschatka.' By J. Grieve. 1764. 'Taurus.' By Th. Kotschy. 1858. 'Maris Carneiro Hydrographia.' By Andres de Poza. 'Congo.' By Pelliccr de Tovarre. 1681. 'Observations géographiques.' Par Peyssonel. 1765. 'The Mediterranean Sea.' By R. Richardson. 2 vols. 'Reisen durch Palestina.' Von U. J. Seetzen. 'Vossius de Nili Origine.' All by purchase.

Accession to the Map-room since the last Meeting of February 28th.—A Chart showing the Track of the Swedish Expedition in 1868 under Nordenskiöld and Von Otter. Presented by Dr. A. Petermann.

The President, in opening the proceedings of the evening, stated that he had that morning received a letter from Dr. Kirk, announcing the unwelcome tidings that cholera had broken out with great severity in and near Zanzibar, and that it had spread to a certain extent into the interior of the mainland. Lord Clarendon had communicated to him (the President) the same intelligence. The object in introducing the subject was to allay any alarm with regard to the safety of Dr. Livingstone, as he was far removed from the zone in which the cholera was raging; but the supplies which had been purchased in Zanzibar, and forwarded to him, would of course be delayed for a time, as the porters conveying them had been attacked by the epidemic.

The following Papers were then read:—

1.—*On Morrell's Antarctic Voyage in the year 1823, with Remarks on the Advantages Steam will confer on future Antarctic Explorers.* By Captain R. V. Hamilton, R.N.

The pre-eminence Britain has maintained in Antarctic discovery we owe to Cook, Ross, Weddel, Biscoe, of the Royal Navy, and to Kemp and Balleny of the mercantile navy. Nor must we forget those public-spirited merchants, Messrs. Enderby, who, to their pecuniary loss, instructed their captains to consider discovery their first object, profit their second consideration, to which we owe the discovery of Kemp, Enderby, Sabrina, and Graham's Land, and the

Balleny Islands. The voyage of a worthy rival to those I have mentioned is that of Mr. Benjamin Morrell, a New Englander, in 1823. It is contained in a work in the library of the Royal Geographical Society, called 'Morrell's Four Voyages.' The first of these was to the Antarctic regions, of which he had had previous experience as mate of a whaler, and the whole narrative leaves an impression of truthfulness on me. Although it is, unfortunately, not as detailed as it might be—as his track is not laid down on the Admiralty chart, containing tracks of nearly all Antarctic explorers—I took the trouble to lay it down, and the results are curious and important.

He left Kerguelen's Land January 11, 1823,* and about the 21st. was in lat. 62° 27′ S., long. 94° 11′ E., or 80 miles north of the land at the western extreme of Wilkes's discoveries in the chart sent by him to Sir James Ross. Extensive ice-fields drove him north to lat. 58° 42′, "between which and the parallel of 60° S.," he says, "we continued to sail eastward till in 117° E. We then again changed our course and steered to the south until the 1st day of February. From the 11th of January, when we left Kerguelen Sound, till the 31st, we had but one day of clear weather, but we now took the wind fresh from the north-east, with an atmosphere clear and pleasant. By an observation at noon (February 1st), we were in 64° 52′ S., 118° 27′ E. The wind soon freshened to an 11-knot breeze, and we embraced this opportunity of making to the westward; being, however, convinced that the farther we went south beyond 64° the less ice was to be apprehended, we steered a little to the southward, until we crossed the Antarctic circle and were in lat. 69° 11′ S., long. 48° 15′ E. In this latitude there was no field-ice, and very few ice-islands in sight." It is very unfortunate so few astronomical positions are given; but those that are given I consider sufficient for all nautical purposes, and the longitudes are by chronometer.

This track passes to the southward of "Budd's high land," and also "Knox's high land," on Wilkes's chart; but although the clearness of the weather is remarked on, neither land nor barrier was seen. Wilkes's narrative is obscure in some portions, as "Totten's high land," for instance; but with regard to "Budd's Land," he says: "land was distinctly seen from 18 to 20 miles distant"—"a lofty mountain range." And with regard to "Knox's high land," he says: "I judged it was 7 or 8 miles distant; the day was remarkably clear, and the land very distinct."

* Morrell, chap. iv.

Well aware as I am of the very deceptive appearances of land in icy regions, where "seeing is not believing," I can hardly think Wilkes mistaken as to seeing land.

Morrell, at all events, proves Wilkes's Termination Land, and those previously mentioned, to be islands, and confirms Sir James Ross's surmise that the discoveries of Wilkes, Balleny, and D'Urville, form a chain of islands rather than an Antarctic continent.

Captain Davis* objected to the position for observing the transit of Venus in lat. 67° s., long. 105° E., as the high land would be between the observer and the sun. As it is more than probable this land is an island, a suitable southern position could easily be attained, and his objection vanishes; but the point should be settled prior to the period for the observation.

And now to return to Morrell. His track is then over a large extent of ocean no other navigator has traversed, between lat. 66° and 69° s., and from 105° E. longitude to the meridian of Greenwich, proving that Kemp and Enderby Land is either one or two islands of no great extent, his route being from 150 to 180 miles south of their position. He also disproves Wilkes's supposition† of a continuous Antarctic continent from "Ringold's Knoll to Enderby Land."

On the 23rd February he crossed the meridian of Greenwich in 69° 42' s., very close to Bellinghausen's track in 1820. February 24th was in lat. 68° 12' s., long. 4° 17' w.; from thence he proceeded to the Sandwich group. Finding no seals there, he left March 6th, and steered to the south-west. On the 10th he was hemmed in with ice for twenty-four hours, "then escaped into an open sea clear of ice, in 64° 21' s., 38° 51' w."—being much more fortunate in this respect than Sir James Ross, who, eighteen years later, was stopped near the same position by an impenetrable pack. He then stood to the south till the 14th, when he attained lat. 70° 14' s., long. 40° w. He here saw no field-ice, and only twelve bergs: found the temperature of the air was 47° and sea 44°. Weddel, not far from the same position a month earlier, found temperature of air from 34° to 40°, and the sea from 36° to 38°.

On the 15th March he was close in with New South Greenland, so named by Capt. Johnson, who commanded an American sealer, with whom Morrell had sailed the previous year; he kept two miles from it, with his boats away sealing for some hours at noon in lat. 67° 52' s., long. 48° 11' w. He says, "The coast trended about s.e.

* 'Proceedings Royal Geographical Society,' vol. xiii., No. 2.
† Wilkes's Abridgment, p. 148.

by s., and we thought we could discern some mountains of snow about 75 miles to the southward." He was then unfortunately obliged to steer north, although the sea was clear, being short of provisions and fuel. March 19th, he says, "We were close in with the south cape of New South Greenland in 62° 41' s., 47° 21' w., by dead reckoning, having had observations for three days. Coast trending s. and s. by w."

He then bears up for Staten Island, and the rest of his cruise offers nothing new. This discovery of Capt. Johnson is not down on any chart or atlas I have seen, and appears to me beyond a doubt, as Morrell coasted it for about 40 miles with his boats away sealing; he appears to imagine the land continuous to his South Cape in lat. 62° 41' s., but he evidently experienced thick weather, as he had no observations for three days. The position of his Cape cannot, therefore, be very accurate; and as Sir James Ross afterwards crossed Morrell's track at right angles, it is certain the land is not continuous. I would therefore suggest that any geographer who may add this land to the chart should name it Morrell Land, in memory of a modest and enterprising explorer, whose exertions and hardships fully entitle him to the honour.

This book was published in 1832 at New York; it is therefore very curious that Wilkes should never have seen it, as he sailed in 1838 on his voyage. Neither does Ross appear to have known it, or he would have settled the position of Morrell's South Cape of New South Greenland, as he was about 60 miles from it on his last voyage.

It is generally considered that an Antarctic pack is much more dangerous than an Arctic, and it certainly is for sailing-vessels. In reading the narratives of Wilkes and Ross to gain information on the two positions assigned by the Astronomer Royal as most suitable for observing the transit of Venus in 1882, I was struck with the much greater advantage steam will give the future Antarctic explorer, both in gain of time and safety, than it has done to the Arctic voyager, owing to the different nature of the pack of the two regions.

In practical results little has been gained by the use of steam in the Arctic seas. Parry, in 1819-20, gained a greater westing at Melville Sound than Kellett in 1852 with a steam tender. Franklin, in Wellington Channel, did more than Belcher who had also a steam tender. In Smith's Sound, Kane, Hayes, and Davis, equalled Inglefield in the *Isabella*. Off Spitzbergen, Phipps and Buchan equalled the Swedish steamer of 1868; and Scoresby, senior, in 1806, surpassed it; as well as Lamont in his well-found screw steamer last year

(1869). Of the two searching-vessels that have been unable to get through Melville Bay, one was a sailing-vessel, the other a screw-steamer. I, of course, do not mean to say I would not rather have the steamer; but, with these facts before me, I do not consider steam has given more than 25 per cent. advantage to Arctic navigation over sails in point of time, and very little in point of safety. Neither do I allude to powerful steamers, but to those of the moderate horse-power necessary for an Arctic vessel to enable sufficient fuel and provisions to be carried. In the Antarctic Ocean I consider at least 100 per cent. will be gained in time and 50 per cent. or more in point of safety by the use of steam over sails.

This is owing to the different nature of the two packs. That of the Arctic consists of floes of ice varying from a quarter of a mile in circumference up to fields of ice whose extent cannot be seen from the mast-head; and, in the confined channels of the Arctic seas, these form obstacles impenetrable to either steamer or sailing-vessel, and distances are so small, comparatively, that when the season is favourable a sailing-vessel soon traverses them, as calms are rare and brief. Sir James Ross* says of the Antarctic pack:—"It consists of heavy floes which have been much broken up, and pressed and heaped together so as to form the most irregular shaped masses, and it seldom happened that we met with any piece more than a quarter of a mile in circumference, thus presenting a striking difference from that of the Arctic sea." "The cause of this is explained by the circumstances of the ice of the southern regions being so much more exposed to violent agitations of the ocean, whereas the northern sea is one of comparative tranquillity."

Wilkes† describes the pack "as consisting of pieces of ice from 6 feet to 500 or 600 feet in circumference."

Cook‡ says, of a pack he skirted for about 100 miles, "This, which I call field-ice from its extent, consists of many pieces of various sizes from 30 or 40 feet square to 3 or 4, close packed, and in places heaped one upon another." Again,§ next year—"The ice in most part lay close packed together, in other places there appeared partitions in the field and a clear sea beyond it." Sir James Ross is the only explorer who has penetrated an Antarctic pack, and Capt. Davis, in his paper, stated, not one of the novices in ice-navigation would have attempted it. They would have returned and swelled the number of "impenetrable packs." We now, reading by the light of Arctic experience, know steam would have easily penetrated with-

* Vol. ii., p. 150. † Vol. ii., p. 293, note. ‡ 'Voyages.' § Ibid.

out encountering the daily danger of being squeezed between two heavy floes, as in the passage through Melville Bay.

Ross,* in his first cruise, met the pack January 1st, 1841; but thick weather, light winds, and a heavy swell, compelled him to keep off till the 5th, when he entered it; finding it, as he says, "by no means of so formidable a nature as we had been led to expect from the accounts we had received of the southern barrier in those parts, where the American and French expeditions encountered it." On the 9th they had passed through the pack and were in clear water. With steam he would have taken the pack on the 1st, and have passed through it in two days instead of four. Here we have a clear loss of six days in the first nine of January. Calms were frequent; the clear-weather winds were adverse; where a steamer would have made 100 miles daily, his sailing-vessels were beating 25 miles: this leewardly quality prevented his venturing into positions of danger, where a steamer would have run little or no risk. After the first week in February young ice, forming four inches thick in a couple of days, impeded their progress, adding greatly to the anxieties of navigation lest they should get beset in a calm. This would have been only a slight impediment to a steamer. In his second cruise, Ross† was forty-six days getting through the pack, which he estimated at 1000 miles in a W.S.W., E.N.E., direction. Had he been able to steer south it would probably not have been more than 200 miles in width. On his own course, steam would have gained twenty-five days, and perhaps more, as the winds were light and variable, and a heavy swell prevented towing with boats.

Had Ross possessed steam, I estimate he would have done in one season the work done by Wilkes in 1840, himself in 1841 and 1842. Wilkes would have done his work in half the time and more thoroughly, as he encountered more dangers from bergs than from pack. I draw the same conclusion from all the narratives I have read.

I trust I have sufficiently proved my opinion as to gain of time; and now for diminution of risk by steam. There are numerous instances in the narratives of Antarctic voyages of the vessels being becalmed in a heavy swell and drifting helplessly down on the pack, or a chain of bergs. One extract from Ross‡ will suffice to show the nature of these dangers.

March 7th, in a calm, he says:—"We found we were fast closing this chain of bergs, so closely packed together that we could distinguish no opening through which the ships could pass, the waves

* Vol. i., p. 177. † Vol. ii. ‡ Vol. i., p. 281.

breaking violently against them, dashing huge masses of pack-ice against the precipitous faces of the bergs—now lifting them nearly to their summit, then forcing them again far beneath their water-line, and sometimes rending them into a multitude of brilliant fragments against their projecting points. Sublime and magnificent as such a scene must have appeared under different circumstances, to us it was awful, if not appalling. For eight hours we had been gradually drifting towards what to human eyes appeared inevitable destruction. The high waves and deep rolling of our ships rendered towing with boats impossible, and our situation the more painful and embarassing from our inability to make any effort to avert the dreadful calamity that seemed to await us.

"We were now within half a mile of the range of bergs. The roar of the surf, which extended each way as far as we could see, and the crashing of the ice fell upon the ear with fearful distinctness, whilst the frequently-averted eye as immediately returned to contemplate the awful destruction that threatened in one short hour to close the world and all its hopes, joys, and sorrows upon us for ever. In this our deep distress 'we called upon the Lord, and He heard our voice out of His temple, and our cry came before Him.' A gentle air of wind filled our sails, 'and we were saved.'"

With steam they would have enjoyed the "sublime and magnificent scene" in safety. In heavy gales, which are always accompanied by thick weather and snow-storms, a steamer could lie in safety under the lee of one of those immense icebergs, almost always to be met with, instead of drifting at the mercy of the wind and waves.

The great danger of an Antarctic pack is, that no matter how far involved in it, the swell caused by heavy gales is felt, and it is impossible to avoid collision with huge masses of ice, by which the safety of the *Erebus* and *Terror* was greatly endangered and their rudders destroyed. This would be the weak point of a screw-vessel with its double sternpost. The turbine principle would obviate that danger. If it is ever brought to a practical result, I agree with Captain Davis in advocating its use for ice-navigation. There are no heavy floes in an Antarctic pack, and therefore no danger of being squeezed between two of them, as in Melville Bay, or driven 40 feet up the side of an iceberg, as happened to the *Intrepid* in 1851. I do not think, therefore, I am assuming too much when I consider steam will materially diminish the risk of the future Antarctic explorer. It also appears to me that the parallel of 60° S. has been crossed too late—very seldom by the middle of December, generally not before the first week of January. I see no reason why it

should not be crossed before the middle of November, which will give a great gain in time and increase of long days. November corresponds to our May, a month in which temperature offers no obstacle to Arctic navigation. Weddel on the 16th October arrived off the South Shetlands and found the land-ice, to his surprise, extending 95 miles from the shore, and up to the 16th November he was unable to get into the land. This, however, had not occurred to him on three previous occasions. He had unfortunately broken his thermometer; but, from his account, I should judge the temperature to have been between 32+ and 16+. To sum up, this increase of time and the use of steam trebles the future Antarctic exploring season, and the latter adds so very materially to safety and certainty, that I think the Astronomer Royal need not hesitate in selecting a position for observing the transit in 1874, should it be an even minor point of importance, and that the vicinity of his positions can be reached I consider as certain as reaching Spitzbergen annually: but our knowledge of the position of the land-ice is not sufficient to enable us to judge correctly as to the difficulties of landing; therefore, to make assurance doubly sure, I agree with Captain Davis in the propriety of a party wintering there—a most desirable plan in many respects, particularly for ascertaining the meteorology of the Antarctic regions.

The PRESIDENT, in returning thanks to the author of the paper, said he himself had no means of ascertaining the accuracy of Mr. Morrell's account of his remarkable voyage in the Antarctic Seas; but he would call upon some of the distinguished navigators, whom he saw in the room, to express their opinions on the subject. He would especially ask Staff-Commander Davis, who had been with Sir James Ross, in his memorable voyage, to state his views on the subject.

Staff-Commander J. E. DAVIS said that Morrell's book had not been overlooked, but had been too carefully *looked over*. He himself had mentioned the voyage last year, when he had the honour of reading a paper on Antarctic Discovery before the Society, and had then stated that the work was unworthy of credence. Admiral Sir Francis Beaufort, when constructing the South Polar Chart, in which he was greatly interested, had examined the work very carefully, but finally rejected it; later still, it had been studied with the view of assisting in the compilation of the Admiralty Ice Chart, but with the same result. No doubt the work was a very remarkable one, and also very amusing; and when first he had opened it accidentally in the middle, he was so struck with its resemblance to 'Robinson Crusoe' that he turned to see if the author told who his parents were, and found that he did. He (Captain Davis) would not say that the whole work was a fiction; indeed, in some parts it bore internal evidence to the contrary, and for the sake of argument he would admit it to be veritable northward of 50°, but to the southward of that parallel it was evident that Morrell was out of his latitude. There were only two ways by which such a voyage as that under discussion could be judged; first, by the experience of other navigators, and, secondly, by internal evidence of the work itself. He (Captain Davis) proposed to examine the voyage by

such lights as his own experience could suggest, and then by a few extracts from the work, placed in juxtaposition with passages from others. In the remarks he had to make, from his own experience, he would ask the Society to bear in mind that he did not speak from the experience gained in one voyage towards the South Pole, but three; he would also ask them to bear in mind that Morrell had only one vessel, and that did not exceed 160 tons' burden—that from the second day after leaving Kerguelen Land, not one day passed for 66 days without his meeting with broken ice, or snow, or hail, or all combined, and that during that time he could not keep a fire, yet the average run of the vessel was about 120 miles a day; taking the course in a straight line, and allowing for ins and outs and variations, the average must have been about 180 miles a day. He (Captain Davis) had often heard Sir James Ross's voyage called the most remarkable Polar voyage ever made, but if that of Morrell's were true, the palm must be yielded to that gentleman. He would not say that such a voyage was impossible, but he should incline to that word rather than "probable." When Morrell started from Kerguelen Land, he well knew that such a voyage, if accomplished, would be trumpeted all over the world as one of the most important that had ever been undertaken, and yet he neglected to give more than two or three positions; had he even appended a map to his work it would have been satisfactory. He passed close to land that had been seen by two voyagers, Wilkes and Balleny, without seeing it; his statement in respect to the temperature of the air and water becoming uniformly more mild as he advanced south of latitude 65° is so totally at variance with the experience of other navigators that one could hardly imagine how a man could have brass enough to put it on paper. An Arctic or Antarctic voyager must laugh at another statement in the book, viz., that whenever they came too near icebergs, and there was a danger of striking, they managed to "bear off" by a timely application of the sweeps. He also asserted that many vessels were lost by the vast waves and whirls occasioned by "rolling mountains" of overturning nicely-balanced icebergs; whereas he (Captain Davis) had never even seen more than three or four in all his experience. An account is given, in the book, of a curious bird, numbers of which were seen: it had a green head, breast variegated with all the colours of the rainbow, tail long and lanny, approaching yellow, resembling a bird-of-paradise; had Mr. Morrell restrained his tongue and pen, a great part of his narrative might have been believed.

The internal testimony of the book also afforded grounds for disbelieving the whole account of the voyage. He visited Auckland Islands, having made the voyage from Kerguelen Land in twenty-two days, or at the rate of about 180 miles a day; and gives a description of Carnley Harbour, with directions for entering, which, if any one attempted to adhere to, he would, most assuredly, lose his vessel: the bearings were wrong. He states the entrance to the harbour as 2 miles wide: it was only one. He said it was 15 miles to the head of the harbour: it was only 10. He described the east side of the island as having sandy beaches, behind which were luxuriant groves of trees, running 5 miles inland, with timber fit for ship-building, while the valleys and plains were clothed with boundless treasures of vegetation. Dr. Hooker, in describing the very same spot, said a low forest skirted the shore, with a dense thicket, while the trees were gnarled and stunted. Mr. Morrell said that birds were numerous and beautiful, hundreds of different kinds, all singing at once, and he described a species of cuckoo, parrots, and parroquets; while Dr. M'Cormick said there were not more than seven or eight kinds of land-birds on the island. Mr. Morrell said fish were abundant, and among them salmon and mackerel; while, on the other hand, Sir James Ross caught only two or three small fish there. Then again, Mr. Morrell says there were mussels from 12 to 15 inches long. He (Captain Davis) had seen very large mussels, but certainly none to

equal those. Mr. Morrell then wound up with what may be considered a "clincher," by characterising the island as "a delightful retreat for a few amiable families." Of the same spot, Sir James Ross said, "Well adapted for a penal settlement." Captain Hamilton had referred to Mr. Morrell's modesty, the following was a specimen of it from his book:—

"I regret extremely that circumstances would not permit me to proceed farther south, when I was in lat. 70° 14' s., on Friday, 14th March, 1823, as I should then have been able, without the least doubt, to penetrate as far as the 85th degree of south latitude. But, situated as I then was, without fuel, and with not sufficient water to last twenty days, destitute of the various nautical and mathematical instruments requisite for such an enterprise, and without the aid of such scientific gentlemen as discovery-ships should always be supplied with; taking all these things into consideration, I felt myself compelled to abandon, for the present, the glorious attempt to make a bold advance directly to the South Pole. The way was open before me, clear and unobstructed; the temperature of the air and water mild, the weather pleasant, and the wind fair. Under such tempting auspices, it was with painful reluctance that I relinquished the idea, and deferred the attempt for a subsequent voyage. The anguish of my regret, however, was much alleviated by the hope that, on my return to the United States, an appeal to the Government of my country for countenance and assistance in this (if successful) magnificent enterprise would not be made in vain. To the only free nation on the earth should belong the glory of exploring a spot of the globe which is the 'ne plus ultra' of latitude, where all the degrees of longitude are merged into a single point, and where the sun appears to revolve in a horizontal circle. But this splendid hope has since been lost in the gloom of disappointment. The vassals of some petty despot may one day place this precious jewel of discovery in the diadem of their royal master. Would to heaven it might be set among the stars of our national banner!"

Taking the whole subject into consideration, he, Captain Davis, was morally convinced that the voyage was never made.

Mr. Enderby said, many years ago Mr. Morrell applied to him to be employed in his service, but he had heard so much of him that he did not think fit to enter into any engagement with him. He did not believe Mr. Morrell had made the voyage which he described in the book. If he did, it was most extraordinary that when he passed Enderby and Kemp Land he did not see the southern parts of those lands, which, *from his statement*, must have been *islands*, for not one word was said in his book about them. The work was full of extraordinary things, and Mr. Morrell appeared to be a kind of Baron Munchausen.

Mr. Galton said, Captain Morrell pretended, at the time when his ship visited the west coast of Africa at about 23° s. latitude, to have made an excursion a considerable distance into the interior. He (Mr. Galton) had travelled through that country, and could say that, while Morrell's description was very graphic and truthful concerning the coast, he evidently knew nothing about that part of the interior. He described it as consisting of rich valleys, with large herds of cattle roaming over them, whereas it was a barren desert.

Captain Sherard Osborn said he could not help wondering that Mr. Morrell, finding the sea so clear and the temperature so warm, did not sail right across the pole, instead of making a circle round it. He quite agreed with the author of the paper in the necessity for exploring the Antarctic lands, as at present our information with regard to them was very imperfect. He thought justice had not been done to the advantages which steam afforded in penetrating the Arctic Seas. The fact was the discovery vessels he and McClintock had commanded were always tied to a big ship, which impeded their progress.

It was true that Kane beat Inglefield in the *Isabella*, but Kane followed the *Isabella*, which had cleared the way. So M'Clintock, in the *Fox*, passed safely beyond where Ross lost his ship and Parry lost his. He expressed his perfect confidence that when the Lords of the Admiralty had carried out proper measures of retrenchment, they would then be anxious to have an efficient body of officers and sailors; and he was firmly convinced that a better school in peace time could not be found for sailors than the Polar Seas, notwithstanding that a dilettante Admiral lately thought otherwise.

Admiral OMMANNEY said he was equally surprised with Captain Davis at the extraordinary speed with which Mr. Morrell had passed over such a great distance when the seas were encumbered with floating ice. With reference to the Antarctic Expedition destined for taking the observations of the transit of Venus, astronomers have decided that the most desirable spot for observing that phenomenon in 1882 is on the southern continent, in latitude exceeding 72° s., near to Mounts Erebus and Terror. But it would be very unwise to send out this expedition without some previous exploration of the Antarctic seas, in order to reconnoitre the position where the observing party can be placed, with the requisite arrangements and equipments for a service of such extremely hazardous character; otherwise that valuable opportunity for the solution of the greatest astronomical problem of the age might be lost for a century. As regards the sort of ship for exploring the Antarctic seas, no one would dream of going there now in such sailing-ships as Sir James Ross had to put up with when he made his important discoveries. With our improved knowledge of strengthening ships, and in the construction of marine engines which are now worked with so much less fuel, we could send forth ships perfect in all improvements of the day, and thus ensure a thorough survey of the southern continent preparatory for this great event. The *Erebus* and *Terror* had been described that evening as having drifted under an ice-barrier, where they seemed to be inextricably fixed, yet Sir James Ross brought these ships home, and managed to escape from many a similar predicament. In the Arctic seas, when he fixed the position of the magnetic Pole, he was given up for lost; four years had passed without any tidings of his party, but he managed to effect his retreat to Baffin's Bay and brought his party home. No tribute exists to commemorate the name and services of that distinguished officer of Arctic and Antarctic renown, Sir James Ross. He (Admiral Ommanney) begged to inform the meeting that a memorial was in progress, with a view to place his portrait in Greenwich Hospital alongside that of Captain James Cook, now in the Painted Hall, and he solicited their contributions in behalf of this object.

Captain HAMILTON said, whatever else Mr. Morrell might not have discovered, he was the first discoverer of guano in the island of Ichaboe and Lobos. The speed of 120 miles a day, with which he made the voyage, was nothing uncommon as the sea was not encumbered with ice. The objection about the size of the vessel was not very forcible, for Weddel made his voyage to the south accompanied by a cutter of only 64 tons, while Balleny was also accompanied by a cutter of the same size. A vessel of the size of the *Wasp* could easily sweep off an iceberg—Weddel did so. Mr. Morrell was a sealer, not an educated man, and therefore due allowance must be made for his errors. However, by-and-by, one proof of the accuracy or otherwise of his descriptions would be afforded by any one coming across New South Greenland. Every ice-navigator knew that the season varied very much in the Polar regions; and Weddel, at his highest latitude, found the temperature of the water 34° or 36°, and the air 42°. Then, too, Weddel had found the sea open, as well as Morrell, while Sir James Ross was invariably almost beset in a close pack, and the difference of temperature between a pack and open water is considerable. It was by no means strange that he did not see

Enderby or Kemp Land, because he passed 120 or 180 miles to the south of them. Biscoe, who discovered them, was not able to approach within 30 miles of them, and therefore he did not give a very accurate account. One great reason why steam alone could not be used to any great extent in the Arctic regions was, that steamers could not carry provisions enough, as they would have to take such a large supply of coals. In the Arctic regions a pack was never in the same place two seasons running, and most probably it was the same in the Antarctic regions, for Balleny passed the preceding year over 30 or 40 miles of water where Wilkes and D'Urville found a perpendicular barrier of ice. With regard to crossing 60° s. in November in the year 1823, Scoresby reached the parallel of 81° n. in April: in 1815, 80° n. was reached in the beginning of the same month; in Davis's Straits, M'Clintock was able to get under weigh on the 18th of April, and in 1857 lat. 74° n. was reached May 21st in Davis's Straits. These facts showed that, as far as temperature was concerned, there was no difficulty in navigating the Arctic regions early in the year; and he did not see why the same rule should not apply to the southern pole.

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2. *On Greenland Fiords and Glaciers.* By J. W. Tayler.

In the 'Proceedings' issued July, 1869, which I received in October last, I see, in a Paper by Mr. R. Brown, that he has arrived at the conclusion that glaciers have "hollowed out" the fiords of the North: by hollowing, I take it for granted he means causing fiords to be where none were before—glacier the cause, fiord the effect. This extraordinary conclusion seems to have passed unquestioned, except by Mr. Whymper.

I have spent the greater part of the last 18 years in that home of glaciers, Greenland, exploring the fiords, but have never seen anything to lead to such a conclusion. I maintain that the reverse is the case—that instead of glaciers excavating fiords, they are continually filling them up. It is true that boulders and *débris*, borne along by the ice, scratch, polish, and grind the rocks to a considerable extent; but, though strong as a transporting agent, ice alone has but little excavating power: it is like the soft wheel of the lapidary—the hard matter it carries with it does the polishing. I hope to show that the power of ice in excavating has been much overrated.

I have described fiords in Greenland in a former Paper. Fiords in general are familiar things to many. I will merely remind my readers that those of Greenland are walled in by rocks averaging 1000 feet in height: their length varies from 10 to 100 miles; breadth 1 to 8 miles; depth of water from a few feet to 200 or more fathoms. The rocks on each side of these fiords are marked by ice-action at intervals, but more so near the glacier.

The deep fiords have, for the most part, glaciers launching icebergs; the shallow ones have not. Some of the largest glaciers are really

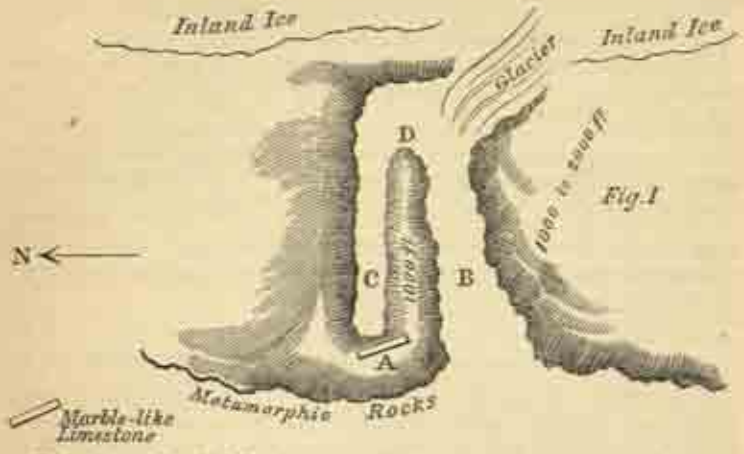
not in the fiords—witness the one north of Frederickshaab, 15 miles broad, which has not made a fiord and does not launch bergs; and for this reason—it has brought down a lot of loose material to a reefy coast and formed a beach at its base, and this great ice-power which we are asked to believe has excavated fiords in granitic rocks, 100 miles long and 3000 or 4000 feet in depth, is overcome by loose *débris* and sand. Why does it not cut its way through these, by far the easier task?

There are numerous fiords in Greenland nearly filled up by loose material brought into them by the glaciers; the first fiord south of the great glacier I before alluded to is only navigable in boats at high water. No icebergs now come out of this fiord; the glacier is, as a power (if I may use the term), extinct—it has choked itself up, it is mastered by soft mud.

The inland ice, from some cause not yet explained (but probably the weight of the interior and higher ice pressing on the lower), moves slowly towards the coast, more like pitch on a roof exposed to the sun than like a solid body forced forwards, and the glacier finds its way into the deep fiords, simply because they afford an easy outlet. The ice brings with it—below, loose rocks and stones, rounded into boulders, and much sand and mud produced by these in their passage over the rocks beneath;—on the surface, angular fragments, fallen upon the ice from the sides of mountains and fiord sides of the glacier. Almost all the lower transported material is pushed into the fiord, the mud floats away, most of the boulders and sand remain, and the first iceberg launched in the fiord commences the slow but certain choaking of the glacier; for, as before shown, it has not power to remove its own loose material. The glacier blocked up, the edge of the ice retires inland by melting, and a stream of water brings down the sand and mud left on the land, making the fiord still shallower. The inland ice now seeks another outlet, and then a deep fiord, perhaps previously clear of ice, becomes encumbered in its turn with icebergs. The ruins of Scandinavian villages may be seen in fiords now almost inaccessible for icebergs, and at the heads of fiords now unnavigable in boats, from deposits from the glaciers.

The sides of many fiords are of soft material—sandstone, with coal, blacklead, &c. Why were these not ground away? And then the shape of some fiords is incompatible with the theory of ice-cutting, for ice could not cut in contrary directions. Take, for example, the fiord Fig. 1; it is the second south of Arksut. At the barrier A there is a large vein of crystalline limestone, some 20 feet broad, not in the slightest degree marked by ice. How could such

a fiord be cut by a glacier? Even if we grant it the power to cut the arm B, it will be hard to explain the arm C; on the same theory



The barrier at A is so high that the existence of the arm C was not suspected until turning the point D.

I maintain that the fiords were in existence prior to their invasion by glaciers. As to their origin, I think the geologist in Greenland will see in the immense number of erupted dykes and upheaval, distortion, and fracture of the older stratified rocks, a cause more adequate to the effect than ice "hollowing."

Alberton, Prince Edward Island,
November 4th, 1869.

ADDITIONAL NOTICES.

(Printed by order of Council.)

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1. *Notes on the Climate and Geology of Abyssinia, with Table of Heights.* By H. Cook, M.D., Surgeon Bengal Army.

The climate of the low-lying strip of country skirting the mountainous region of Abyssinia proper, on the sea-board, differs from that of the Highlands extremely—differs, indeed, as much as if the countries themselves were severed by wide tracts of ocean or parallels of latitude; the climate of the one resembling in many points that of Scinde, that of the other more nearly approaching the climate of the Neilgherries.

The seasons of the two countries differ widely: those of the lowlands, like

those of Scinde, having only a division into a hot weather and a colder one, with a very light and precarious annual rainfall; those of the highlands presenting the anomaly of a tropical arrangement into a hot, a cold, and a rainy season, with an European temperature, and a tropical monsoon.

The seasons, then, of the low country may be said to consist, like those of Scinde, of a hot, and a comparatively cold season.

In November the mean daily maximum was 96°.4, and the extreme maximum 105°; while the mean minimum at night was 67°.4, the lowest point reached being 66°. The diurnal range was thus 29°. The air was dry, the mean difference between the dry and wet bulb thermometers being 13°.

The months of December and January were cooler, the mean maximum reaching 90°, and the extreme maximum 96°; the mean minimum 70°, and the lowest temperature 63°. The air was somewhat less dry.

In February, the rain—which was expected to have made its appearance before, but did not—fell in light showers, generally during the morning and evening, reducing the maximum temperature to 84°.6, and the extreme maximum to 91°; while the difference between the dry and wet thermometers fell to 7°. The mean minimum at night was 71°.8, and the lowest point reached 67°.

It was, perhaps, advantageous to the health of the force located on the coast that the rainfall was so scanty during this season, as had it been long continued it would probably have engendered fevers more destructive than the effects of the heat and drought. The rain, indeed, was very pleasant, as it gave for a time some respite from the clouds of dust which habitually hung over the camp, and produced a state of chronic dust-storm most unpleasant to exist in; a thorough dust-storm, which, like those of Scinde, occasionally occurred, was beneficial, as it cleared the atmosphere of the oppressive sultriness which the peculiar electrical condition coexistent with atmospheric dust occasions, and lowered the temperature considerably for the time.

Even with the small amount of rainfall which took place, the aspect of things changed considerably; the scanty-leaved acacias threw out fresh shoots, the dust-covered salicornias which cover the sandy plain grew green again, and a thin green herbage made its appearance, where all before looked dead.

Throughout the cold season the land and sea breezes occurred with pretty much regularity. At night, some hours after sunset, a light westerly wind set in, which continued until morning, and occasionally for some time after sunrise; then occurred a lull, which at times was most oppressive until ten or twelve o'clock, when the longed-for and life-giving sea-breeze usually commenced from the east or north-east, and blew strongly until evening, when the lull recurred, until the land-breeze recommenced from the west.

In the month of March the hot season began, and the heat grew in intensity, until in the early part of the month of June the mean daily maximum reached 105°, and the minimum rarely fell below 83°, giving an estimated mean temperature of 94°. The sea-breeze, however, happily still continued, and, indeed, blew with greater force as the soil became more intensely heated by the sun's rays. The air was very dry, there being often a difference of from 20° to 24° between the readings of the wet and dry thermometers; and the maximum heat in the sun's rays reached 145°.

At Kumayle, ten or twelve miles further inland, the heat was still greater as the sea-breeze became heated in its passage over the burning sands of the plain. Here the thermometer marked 108° in the shade daily; and a violent gust of wind, instead of cooling the air, had the effect of raising the thermometer a degree or two higher.

The climate of the fifty miles of the pass varies, of course, greatly with the difference of elevation, but it assimilates more nearly with that of the lowlands.

The rainfall of the cold-weather months extends up as far as Suru, or Umdul Wells (or about 3900 feet); while that of the monsoon of the highlands extends generally about the same distance downwards, though its effects in the shape of floods and torrents are felt throughout its length.

The temperature at Suru during the ascent of the army in February and first half of March was moderated by the effects of the rain on the mountains, and of the clouds and mists which continuously hung about their summits. The nights were much cooler than those of the plains, and the range of temperature greater, thus resembling the conditions of the mountain climate at Senafé. On clear days, however, when no clouds intervened, it became evident that the confined air in the pass could become heated equally with that of the plains, though some 3000 or 4000 feet above them. Thus the maximum temperature in March reached, on several occasions, 90° and 98°; while at others it was in the same month as low as 72°. The thermometer in the sun's rays rose on two occasions to 141°.

On the return march in May the heat at Suru was very great, very little, indeed, less than that of Kumayle, the maximum thermometer reading in the shade 105°. At Rahaguddy (some 3800 feet higher), in the month of March, the maximum temperature had decreased to 86°, and the minimum to 58°.5.

I have mentioned the natural division of the seasons of the highlands into a cold-weather, a hot, and a rainy season or monsoon. The cold season may be said to extend from October to February, the hot from the beginning of March to the middle of June, and the wet from this time to the end of September.

The only month of the cold season of which I have reliable data collected at Senafé is December, which may, perhaps, be taken as a fair mean of this season generally, though colder weather occurred in the following month.

The mean maximum for this month was 73°.6, and the mean minimum 43°, giving an estimated mean temperature of 58°.3. The extreme maximum was 77°, and the lowest temperature registered 39°, showing a range of 38° during the month. The prevailing wind was from south-east. The days were very pleasant, but the nights very cold under canvas, with heavy dews.

During the month of March (at the commencement of the hot weather) the nights still remained cold, giving a mean minimum temperature of 52°; but the heat during the day had considerably increased, the mean maximum being 80°, and the greatest maximum 84°. The range between the mean temperatures was 28°. The air was very dry during the day, the difference between the mean maximum dry-bulb readings and those of the mean maximum wet being 20°.5.

Thunderstorms occurred on several occasions, and during one which happened on the 29th, one inch of rain was gauged. The general direction of the wind was easterly, occasionally veering to the north or south; and on several occasions a westerly or land wind prevailed during the early part of the day.

The month of April was the hottest of the hot-weather months; the mean maximum was 81°.5, the mean minimum 54°.5; the extreme maximum 86°, and the extreme minimum 49°. The dryness of the atmosphere differed nothing from that of the previous month. There was a pleasant amount of cloud tempering the sun's heat, and a fresh breeze from the east and south-east during midday. The land breeze from the west occasionally blew during the early hours. Thunderstorms were prevalent during the latter half of the month. Rain fell on three occasions, giving a total of 1·4 inch.

The month of May was milder; rain, generally accompanying storms of thunder and lightning, fell almost every day for the first half of the month, not heavily, but in sufficient quantities to render the air soft and genial and decrease the temperature.

The mean maximum for the month was 77° only, and the mean minimum

54°.5; the greatest maximum 83°.5, and lowest reading 49°. The range of temperature was therefore less, the mean diurnal range being 22°.5, and the extreme range during the month 34°.5. The estimated mean temperature was 65°.7.

The wind continued easterly and south-easterly; the days were generally cloudy, or with alternating cloud and sunshine.

Throughout these months the quantity of atmospheric ozone was never deficient in any very marked degree, but gave generally high averages. The mean quantities for the month of March were 4.0 by day and 6.2 by night; for April, 2.9 by day and 5.9 by night; and for May, 5 by day and 7.3 by night. As in Europe, it was found that there was a marked excess by night over that of the day, in damp soft weather as compared with dry, and after the occurrence of storms of thunder and lightning; but, contrary to European experience, the east wind was the ozoniferous one, as it bore with it the influence of the sea.

During a portion of the last month of the cold season (February) and the first six weeks of the hot, especially towards the southwards, rain is expected to fall. These rains are termed the "Ilains of Bounty," but the quantity and season of their fall seem alike precarious and uncertain. At Magdala, in 1867, there were but ten days in March and two in April on which rain fell, and at Senafé rain occurred only on two or three days in March and on five in April.

This description of the general characteristics of the climate of Northern Abyssinia holds good throughout the three great divisions of the country, Tigré, Amhara, and Shoa, though there are variations of temperature corresponding with differences of elevation.

Through the kindness of Dr. Blanc, who lent me his meteorological journal kept at Magdala, I have been able to prepare a table of mean temperatures for the seasons at that place; and in the 'Transactions of the Medical and Physical Society of Bombay,' for the year 1843, is a paper on the Climate of Shoa, by Dr. Kirk, who accompanied the Embassy to the Court of Shoa in 1841.

At Magdala the mean temperature of the cold-weather months, from October to February, was 56°.2. Of the hot season, from March to June, 65°.5, while that of the wet season, from July to September, was intermediate, and gave a mean of 60°.

At Ankober in Shoa, lat. 9° 35' N., the mean temperature of the cold season was 52°.6; of the hot, 58°.5; and of the wet or monsoon season, 56°.3.

At Magdala, in the year 1867, the number of rainy days in the month of July was 22, in that of August 25, and in September 10. At Ankober in 1842 there were 28 rainy days in July, 28 in August, and 24 in September.

The most remarkable point in the climate of Abyssinia is the occurrence of a well marked rainy season, or monsoon, in a climate otherwise strictly temperate. Rainy seasons, such as the well known south-west monsoon of Western India, occur also in other parts of the world, as in Guinea, Mexico, and Central America, and to a less extent elsewhere, but these are all in tropical climates and combined with very high temperatures.

Occurring as it does here in what would otherwise be the height of the hot season, it exercises an important influence in moderating the temperature, increasing the fertility of the country, and in keeping up its water supply; but its importance does not cease here: the water thus poured out on the mountains of Abyssinia, as Sir S. Baker has so graphically shown, forms a most important element in the annual overflow of the Nile, and in this way the Abyssinian monsoon is perhaps of hardly less importance than that of India.

The extent of country over which this monsoon falls includes the whole of Abyssinia proper, and a large tract of country lying to the westward; probably from the 8th to the 16th degree of north latitude, and in breadth from the 40th to 35th meridian of east longitude.

The amount of rainfall is doubtless unequal: less to the eastward and north-

ward, more copious to the westward and southward, of the mountain-system. I do not think that in the region around Senafé there is a very heavy fall. The evidences of a copious monsoon, as I have seen them on the Western Ghats of India, are altogether wanting. The houses and churches are flat-roofed, and constructed of materials but ill fitted to withstand heavy or long-continued rain; the trees are bare of moss and ferns, and there are no collections of water into ponds or lakes. It is only as we journey to the southward that these indications of a moderate fall are lost. At Addigerat the houses are still principally flat-roofed, though here and there a circular thatched roof is seen. These increase in proportion until after passing Antalo (a hundred miles south of Senafé) none but circular, high, conical roofs are met with.

In the mountainous region of Wojerat, south of Antalo, the forest is dense, and the trees are thickly hung with moss and drooping festoons of ferns, two of which are identical in species with those found in the forests of the mountain ranges of Western India, where the rainfall amounts to 250 inches during the monsoon. South of this parallel of latitude are the lakes of Ashangi, Haik, and Dembea, and here also are those wonderful river-systems where the streams run through valleys of erosion 3000 feet below the level of the surrounding country. Dr. Kirk estimated the rainfall at Ankober to be about 100 inches, judging from his knowledge of the fall in Western India. This may be a fair estimate of the fall at Ankober, but I believe that this amount is considerably exceeded in other parts of the districts over which the monsoon extends, but not in the north-eastward.

The suddenness with which the rainfall commences on the eastern ridge of the table-land is remarkable, and also the fact that none takes place over the Conkan, or seaboard, as is the case in Western India, where the fall is heavy over the Conkan, and is rapidly dissipated towards the opposite flank of the mountains, so rapidly, indeed, that in some localities there is a difference of 150 inches in the space of fifteen miles easting. In Abyssinia the downpour would appear to increase in amount as the clouds pass westward, until the moisture is dissipated over the burning plains of the Soudan. The wind-currents during this season of the year are east and south-east, pointing toward the tract of country, in the centre of the continent whose vast deserts, being heated more and more as the sun passes northward, become the foci of the indrawing masses of atmosphere, and thus the maintaining of the whole phenomena. The great volume of moist air that is thus drawn in over the country comes from the region of the Indian Ocean or Arabian Sea, over which at this time of the year the south-west monsoon, laden with moisture from the Equatorial Sea, is blowing. The series of causes, therefore, which in action bring about the south-west monsoon of Western India, have a distinct and connected influence on the amount of rainfall on the Abyssinian mountains, and thus on the welfare and prosperity of Egypt.

Sketch of the Geology of the Lowlands.—A stretch of sandy plain, but a few feet raised above sea-level, skirts the mountain ranges which form the highlands of Abyssinia.

This plain, on the shores of Annesley Bay, varies in width from 1 or 2 miles to 10 or 12. The sand of which it is composed is exceedingly soft and loose above, but becomes hard and laminated below, until at a depth of 40 or 50 feet it rests on a coarse gravel, composed of quartz and the debris of trap-rock.

Rising above the sandy level in the vicinity of Tooka are two or three isolated ridges of volcanic origin, some 60 or 80 feet high. These are composed of trap, massive in some strata, ashy and friable in others, capped with a layer of basalt, and pierced by dykes of a red, spongy, and vesicular trachyte. The strike is more or less north and south, and the dip west.

Near the southernmost of these hills a well was dug some 15 feet in depth, which yielded water of a temperature of 115°.

South of Tooka the mountain ranges approach nearer the waters of the bay, leaving only a narrow strip of sandy shore, which is thickly covered with the débris washed down from the hills, consisting of masses of granite, gneiss, felspar, and quartz.

On the south of the bay rises a cone-shaped hill of trap-rock, which has evidently been the outlet of a volcano now extinct. In its vicinity there are quantities of obsidian, red porous tufa, and pumice.

On the opposite side the bay is bounded by the peninsula of Bari. The hills here are composed of metamorphic strata, of which mica-schist, mica-slate, and gneiss are the chief components, and further south, towards the bottom of the bay, these are overlaid by strata of trap-rock.

Traversing now the sandy plain from Tooka towards the mouth of the pass at Koomaylie for some 6 or 8 miles, we cross the southern spur of the Gideen mountains (an outlier of the great ranges), which is here composed of metamorphic rock; and then an intervening level tract of firmer sand, we reach Koomaylie, which is some 450 feet above the level of Tooka.

The scenery here is grand. Range behind range of wooded hills can be distinctly made out, their outlines running down, meeting and interlacing in the centre, marking the line of the winding torrent-bed, while far above all, and usually shrouded in mist, rises a huge peak which crowns the view, and indicates to some extent the height to be attained during the ascent of the 50 miles of Pass to the distant table-land.

Geology of the Pass.—The hills skirting the plain, the outlying ranges, are low, thickly covered with stunted jungle and stony débris, which hide to a great extent their conformation. The strata are much tossed and jumbled, and the dip varies, but is generally eastward; the strike follows that of the great range.

The line of the Pass winds greatly, but follows a W.S.W. course.

Proceeding up the Pass, the strata are at first composed of soft, friable metamorphic schists, with the mica arranged in flaky layers between the harder constituents of the rock, and studded thickly with coarse earthy *garnets*. These are generally of the true crystalline form, rhomboidal dodecahedrons, and at times translucent, but more often earthy and dull.

Further on the strata vary much, in some places compact and solid, in others fissile, and passing into a black shale containing thin seams of *plumbago*, some of which gave a clear blacklead line on paper.

As the Pass closes in until it reaches its narrowest limit, some 15 or 20 feet in width, the strata become more solid; *gneiss* takes the place of the shales, and in one place a granite rock of great thickness is reached, while vast boulders of *greenstone* and allied rocks choke the narrow gorge.

After this, which has somewhat the appearance of an anticlinal axis, the strata again become more schistose, and as they do this the sides of the gorge become less perpendicular and slope away at various angles, until at Sooroo, some 12 or 14 miles from the commencement of the defile, the Pass opens out into a narrow valley.

The water wells up here in considerable quantity at a temperature of 83°, and thence flows down the Pass to Lower Sooroo, at the entrance to its narrowest portion.

The Pass from hence to Undel wells, about 12½ miles, is more open, and the strata schistose; height about 4000 feet.

At Baraguddy it again narrows, but between these places are some open spots, and through the ravines and gorges which open into the main Pass glimpses of the mountains forming the back-bone of this elevated region are obtained. These summits are flat, and capped with an enormously thick stratum, white in colour, which is probably trachyte.

After leaving Baraguddy the strata continue to be metamorphic schists

for three-quarters of the ascent, when these cease, and are replaced by trap; sometimes earthy, at others volcanic ash, and again trachytic. The trachyte is white, very closely resembling a very fine sandstone, but in some places columnar.

The summit of the Pass is about 8000 feet in altitude, and the view down it magnificent. The table-land on the summit is narrow, and its level broken by several ranges, some of which rise 1000 feet above it. These are composed chiefly of trap, but on the west rise some remarkable rocks of sandstone, which, shutting in the valley on that side, run down on their western flanks some 800 or 1000 feet into ravines, which, commencing thus suddenly, stretch away for many miles westward, until they merge into a broader vale, apparently running north-east and south-west, at a considerably lower altitude. The scarped hills on each side the ravines show the long continuous parallel lines marking the trap-formation.

The height of Senafé above the sea, derived from a series of observations with the mercurial mountain (Newman's) barometer, and by the boiling-points of three thermometers, I have placed at 8175 feet. The heights of places southward I estimated chiefly by a pocket aneroid, set to the mean corrected mercurial barometer readings. This aneroid was corrected for temperature, and, on my return to Senafé, varied in a very trifling degree only from the reading of the mercurial left there. The mercurial barometer had previously been compared with the standard-bar at the Observatory in Bombay, and on comparison again at Zulla, with the barometer on board H.M.S. *Octavia*, the readings were almost identical.

The route to Ashangi trends almost due south, and runs along the same elevated ridge or table-land reached at the head of the Pass at Senafé. It varies much in width; in some places spreading out into broad downs, in others reduced to a narrow neck by the deep valleys, which commence abruptly on either hand, with sudden descents of many hundred feet. The altitudes vary also, falling to 6800 at Agula and Dongola, and rising at the mountain passes of Attalu and Pologo to 9800 and 10,400 feet; while still further south on the Waldia plateau an elevation of 10,800 feet is attained.

Leaving Senafé, the route passes south to Goomgooma, distant about 12 miles. The metamorphic series of rocks is met with for the last time for many miles, in crossing the spurs of the eastern range of hills; and we then reach the massive sandstone hills, which rise above Goomgooma to a great height. The sandstone contains, I believe, no trace of any fossil. The strata are enormously thick and massive, and horizontal in position.

The route to Fokada passes first over a lower range of this sandstone, on to some broad grassy downs, free from hill-ranges until nearing the latter station, when sandstone is again reached. Further on the road winds on the brink of a sudden declivity, where commences a series of valleys, bounded by parallel scarped hills, along whose sides are traceable the continuous lines spoken of before, as marking the trap-formation. The scene resembles many such amidst the trap-hills of the Dekkan. In the far distance are visible some high peaks, which are said to mark the position of Adowa and Aksum.

The plain of Fokada is formed of "black soil" (like that of India), and a substratum of black basaltic trap, while on the north towers a hill of columnar trachyte. At Addigerat the ranges, which run more or less north and south, are composed of sandstone capped by trap—either basalt or trachyte, and lying on trap. They are from 500 to 800 feet in height. This formation continues to Mai Wuhiz, 14 miles distant, on the road to which we pass an excavation in this sandstone, which has evidently been intended as a small Cave Church, a sort of prototype of the grander Cave Church met with further

south. The excavation is about 18 feet by 12, with side aisles, and a semicircular apse at the east end. The trap strata capping the sandstone hills in the vicinity are columnar.

From this to Addabaga, 16 miles, we pass over the broad plains of Haratnât, bounded by parallel ranges of the same sandstone and trap formation. On the eastern range, close under which the road passes, are some well built circular towers. On the right the range terminates in a high pyramidal mountain, on which is placed the stronghold of Endâtsiem, one of the strongest forts of Tigré. The sandstone strata are red in colour below, and white above. The elevation of this tract is much the same as that of Senafé; but in marching to Dongola, 10 miles distant, we descend about 1000 feet, and on reaching the lower level pass over strata of the metamorphic series. At one spot the ground was covered with great quantities of slag, and the guide informed me that for many years iron-ore had been worked there.

At Dongola we reach the termination of the sandstone series on this parallel of latitude. The strata, which have continued more or less horizontal, here dip south, and are overlaid by the commencement of a series of limestone strata which extends from this spot for 60 miles to the southward. A spur of the sandstone hills runs just beyond the valley of Dongola, shutting it in on the south, and in this is the Cave Church for which this locality is celebrated. There are three other such churches still existing, one at Avrahas-vahs, in this locality, a second at Womberta, in the sandstone hills, about 14 miles distant, and a third at Lalibela in Lasta. It is said that ten cave churches were thus excavated by the Emperor Lalibela in olden times.

In advancing from Dongola to Agula, 9 miles, we pass over a series of low rounded hills of this limestone, which are generally stony and barren, or covered with low mimosa-scrub. At Agula are the ruins of the Church of St. Kirkos. The valley is traversed by a stream of considerable size, flowing westward. The limestone strata are here and there interleaved with a harder stratum of arenaceous limestone, almost approaching a sandstone in character, but containing traces of fossils.

The 16 miles of route to Dolo cross over three ranges of hills, running more or less east and west. The whole tract is stony, barren, and deserted; a condition of things which seems to characterize the limestone formation. The plain of Dolo, however, is green, and well watered by a stream of moderate size.

At Eiklut, 9 miles further on, there is a good deal of vegetation and water, but the substratum is trap rock.

Passing over more limestone hills, we descend a ghat to the broad plain of Antalo, on which our fortified camp was placed (the town of Antalo lying on a spur of a high hill on the west of the plain). The plain is covered with a layer of "black soil," indicating the nearness of the trap-formation, which recurs here, as I ascertained on my return route, when I passed northward to Chelicut. The road to the latter place from the camp passes across the plain northward, and then through some very broken country into the valley of Chelicut.

In traversing the plain I passed over strata of limestone, and reached a spot where nodular basalt cropped up, and in this vicinity found some limestone of a dark blue or black colour, and subcrystalline texture, containing white casts of an indistinct bivalve. Further on the trap series became more marked, and in ascending again from Chelicut, which lies about 500 feet below Eiklut, to the latter place, the strata for most of this thickness were of trap.

Passing south from Antalo to Mesinuk, 16 miles, the route lies over high ranges of hills, which run almost east and west. These are of limestone, and on descending into the valley of Mungi, which lies midway, a still higher

series of mountain-ranges comes into view, the first range of which is cross-cut by the pass. It is here, in this natural section through the range, that one of the most interesting points in the geology of this district occurs. The pass is very narrow, and filled with most luxuriant vegetation, while down it rushes a beautiful stream of water, overhung by the branches of the stately trees which fill the ravine, and fringed by masses of beautiful ferns and flowering plants of European species.

The pass is flanked on the east by towering masses of enormously thick sandstone strata, cropping up beneath with a *clay-stone trap*, mottled white and red. Further on, on the same side of the pass, and *apparently* underlying the sandstone, was a very massive stratum of fine-grained limestone, containing small indistinct fossil casts, while on the west side of the pass the strata were contorted and elevated, and the dip in some places was almost vertical. Throughout the southern half of the pass, for a mile or so, there were evidences of much dislocation and displacement.

The pass opens out suddenly on the beautiful little vale of Meshuk, traversed by a stream of water fringed with a grove of magnificent willow-trees, some of whose trunks were 6 or 8 feet in diameter. The range on the east of the valley is of sandstone, but trap is also met with, though I am unable to say in what relative position. Here the limestone series ends; from this spot southward all is trap, varying in character, in different places, from basalt to soft ashy trap, in some places amygdaloid and vesicular, and containing zeolites, in others earthy and nodular, and interseamed with beds of a peculiar red earth, which is very often seen amidst the trap series of the Dekkan Hills.

From Meshuk to Ashangi the country is wild in the extreme. The route passes over a range of mountains, reaching an elevation of 9800 feet, thence across a still higher range of 10,400 feet to Mukhan, and again over the forest-clad ranges which intervene, down into the valley of Ashangi, which lies at about the same elevation as Senafé, or perhaps somewhat higher. Beyond this I could not proceed, as I met here the force returning from Magdala.

Glancing, then, over what I have said, we find on the coast evidences of somewhat recent volcanic action in the trap-hills and the volcanic cone, with its scoria scattered around; while the temperature of the water so near the surface, and the existence of several hot springs in this sandy tract, as at Aftah, and in the vicinity of Arkiko, point to a somewhat more than usual subterranean heat now existing.

The great mass of the mountain-ranges traversed by the Pass consist of metamorphic rocks some 5000 or 6000 feet in thickness, overlaid by trap. Then on the highlands sandstone, and sandstone overlaid by trap, extending from Senafé to Dongola, a distance of 70 miles; afterwards the limestone series for 60 miles, succeeded by trap to an indefinite distance.

This trap closely resembles the trap of the mountains of the Dekkan, and in appearance is identical; much of the limestone resembles, in general lithological character, the limestone strata of the secondary period, which underlies the nummulitic limestone of Scinde and Beloochistan. The most distinctive fossil we discovered in it is a *cidaris*, which seems to point to the oolitic series. The whole tract of this limestone-formation lies at a lower elevation, by some 1000 or 1200 feet, than that of the trap and sandstone north and south of it. Of its relative geological position and age I cannot speak decidedly, and, indeed, in this paper, desire only to sketch broadly the chief outlines of the geology of the country, and to trench as little as possible on what Mr. Blanford, the appointed geologist to the expedition, will have to say.

TABLE of HEIGHTS of the LINE of ROUTE of the ABYSSINIAN FIELD FORCE, from SENAFÉ to ASHANGI.

Station.	Difference of Height of Barometer from the Standard Mean at Senafé.	Temperature.	Ratio per Tenth, in Feet.	Height.
Senafé	22·560	..	..	8·175
Gunguma	+ ·560	65	121	7·510
Fokada	− ·210	63	125	8·425
Addigerat	− ·100	65	125	8·300
Mai Wahig	− ·410	61	126	8·679
Addabaga	+ ·100	62	124	8·050
Dongola	+1·220	66	118	6·736
Agula	+1·265	66	118	6·700
Dolo	+ ·790	66	121	7·207
Eikulita	+ ·670	65	121	7·359
Cheliest	+1·150	65	120	6·800
Autalo Camp	+1·055	70	121	6·905
Musgi	+1·230	70	121	6·700
Meshuk	+ ·150	65	122	7·992
Pass, summit of	−1·663	60	136	10·420
Attala	− ·160	62	124	8·361
Pass, summit of	−2·210	56	137	11·189
Mukhan	− ·010	60	124	8·163
Ashangi	− ·135	65	126	8·343

Computed by Dr. Guyot's Table,

HENRY COOK, M.D.

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2. *Discovery of a New Channel through the Forcados River to the Town of Warré.* By CHARLES LIVINGSTONE, H.M. Consul, Fernando Po.

(Communicated by the FOREIGN OFFICE.)

"MY LORD,

"A brisk trade in palm-nut kernels has opened up recently in Benin. The town of Warré is the chief seat of this trade; but it is said to be 150 miles from the sea by the tortuous channel of the Benin. Several English schooners have gone up to Warré notwithstanding, and lately a steamer, belonging to a Hamburg Company, has towed up one of their barques, and is making regular trips. Shortly before my visit, John H. Louche, Esq., of Glasgow, thinking that the Forcados might be a shorter path to Warré, explored it in his boat from Warré to the sea, and found abundance of water, and a straight channel. He mentioned this to the Hamburg captain, who came down in his steamer in five hours. The Benin Channel took twelve hours with the tide. He found a good bar with 20 feet of water, and fit for sailing-vessels. There is a capacious harbour inside the bar.

"The Forcados belongs to Chinomé, son of Queen Dolo, of Warré. He is willing to have the river used, and offers to protect any trader who may go to it.

"*Fernando Po*, Nov. 24, 1869.

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3. *Notes of a Journey from Chin-kiang to Hankow.*

By Alexander Wylie.

The voyage up the Yang-tsze as far as Hankow, 588 miles from Shanghae, is one of such constant occurrence, and has been so frequently described by European travellers,* that it would seem superfluous to dwell on particulars regarding it. Beyond that port comparatively few Europeans have yet ventured, and the most notable expedition is that of Captain Blakiston, who made his way to a distance of 961 miles farther up the great river, and has given to the public a very trustworthy and interesting account of his trip;† while Mr. Pumpelly, the American traveller, has described, from personal observation, the leading geological features as far as the prefectural city of Kwei-chow.‡

From Hankow to within a day's sail of the city of I-chang, the course of the river is through an alluvial plain, with occasional clusters of hills here and there. From the last-named city the upper river navigation begins, and we enter upon the long series of gorges by which the stream makes its way through the great longitudinal mountain-chain of Central China. These are a formidable obstruction to the free navigation of the river; but, in that respect, they are surpassed by the numerous rapids, which occur in continuous succession, from I-chang to the highest point attainable by boats. The chief points of commerce are Sha-she, I-chang, Kwei-chow, Yang-heen, Foo-chow, Chung-king, Loo-chow, and Sen-chow; and at most of these there is a navigable tributary of considerable length. At the city of Sen-chow the River Min forms a confluent, almost rivalling in magnitude the main stream, and up this river we tracked our way to the provincial capital.

As I have elsewhere given a minute description of this part of our journey,§ I will not here reiterate the details. The volume of water is but slightly diminished till we reach the city of Kea-ting, though the depth varies greatly in places from the widening of the channel. From this point upwards we observe a gradual diminution, and, as we approach the capital, the shoals offer a good deal of obstruction to the free passage of boats. It is only during the summer months that that portion of the river can be travelled, and in the winter time boats do not go higher up than Kea-ting. For picturesque beauty this river is nothing inferior to the Yang-tsze, the scenery offering many exquisite points of view. The prefectural city of Kea-ting is an important centre of trade, standing, as it does, at the confluence of the Min and Yang rivers, two principal arteries of communication with the northern and western parts of the province.

There are several great branches of industry along the banks of the Min. The coal-mines form a perennial source of prosperity and wealth, extending for many miles on both sides of the river. The salt-wells, so remarkable for their construction and numbers, are an equally indispensable institution, upon which the western provinces are entirely dependent; while the oil-wells, not far distant, furnish another, though less extensively used, article of domestic economy. The wax-tree plantations, chiefly in the vicinity of Kea-ting, supply

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* 'An authentic Account of an Embassy from the King of Great Britain to the Emperor of China.' London, 1797. 'Narrative of the Earl of Elgin's Mission to China and Japan.' London, 1859.

† 'Five Months on the Yang-tsze.' London, 1862.

‡ 'Geological Researches in China, Mongolia, and Japan.' New York, 1866.

§ 'Journal of the North China Branch of the Royal Asiatic Society.' New Series, Part 3, 1863.

the material for the coating of common candles, this being necessary to impart the requisite solidity, the inner part being made of vegetable tallow, which is excessively sensitive to heat. Many of the natives occupy themselves during the winter months gathering the minute particles of gold which are washed down that and the adjacent rivers, and become deposited towards the lower parts of the bed, which are only accessible in the winter months, when the water is at its lowest. Another speciality of that region is silk, which is largely cultivated, Kea-ting and the neighbourhood being famous for the production of white silk.

As an object of antiquarian interest, there are few things in China that surpass the remarkable caves of the Man-tsze, one of the early races, who were exceedingly numerous and powerful in that part of the country. Their dwellings in the cliffs still remain in great numbers, alike suggestive to the archæologist and the historian.

The provincial city of Ching-too is one of the largest in the empire, and has some streets equal, if not superior, to any that I have seen elsewhere. Extensive warehouses abound, both in the city and suburbs. The shops are well stocked; almost every commodity is to be found, and English, French and Russian goods are no rarity. Being the seat of the provincial government, of course the official establishments are numerous and imposing, and those connected with literary advancement are on a scale indicative of the prominent position held by such attainments in the national estimation. Like many of the cities in China, Ching-too can boast a very respectable antiquity, and during the third century of our era it was the site of the imperial residence. The only description we have of the city by any European is that of Marco Polo, whose brief, but graphic, account might, with slight modification, answer very well to its condition at the present day, although he portrays a state of things six centuries past.

This city stands in a level plain, probably about a hundred miles from north to south, and nearly as much from east to west, irrigated by a number of streams. The River Min rises in Tartary, and is augmented by numerous tributaries, being confined within its rocky banks for several hundred miles, till it reaches the district city of Hwăn. There, emerging from all restraint, it divides into a series of branches, spreading like a network, and fertilising the great plain. The larger number of these run south of the capital, and become concentrated again in the main trunk of the Min; but one system of branches flow north of the city, and are diverted into other channels.

Leaving Ching-too on the 27th of July, 1868, to traverse the plain in a northerly direction, we passed the first branch of the river, named the Yew-tsze-ho, a few miles from the north gate, by a bridge at the village of Sze-ma-keaou. The continuation of this forms the navigable river flowing past the east gate of Ching-too, and known as the Outer River. The Pih-muh-ho and Sai-yun-ho, two other streams radiating from Hwăn, unite their waters to the south of the district city of Tsung-ning, under the name of the Tó River. This we crossed by a handsome stone bridge, at the town of San-ho-chang, about a dozen miles beyond the Yew-tsze-ho. Below this it flows in an easterly direction, receiving two accessaries from the north-west, a tributary from the south-west, and an affluent combining the waters of two branches on the north side, a little beyond which it unites with the Meen-yang River, and flows south, under the name of the Tó, to the departmental city of Loo, where it disembogues into the Yang-tsze. The Tae-ping-ho, another of the streams that radiate from Hwăn, divides into two branches, which re-unite lower down, and again divide into three branches, the southern of which passes north of the city of Tsung-ning, and south of that of Sin-fan; after which it bifurcates, forming the above-mentioned two accessories to the Tó from the north-west. A little below San-ho-chang we crossed one of these arms, named the Kwan-

keaou-ho, being the boundary between the districts of Hwa-yang and Seu-too. There is a fine stone bridge, ornamented with a series of figure-heads of dragons and other fabulous animals. A short distance further brought us to the Kin-shwuy-ho, the northernmost of the two arms, a broad shallow stream made up of several confluents, spanned by a stone bridge. A mile or two beyond this is the district city of Sin-too, of medium size, with a tolerably prosperous appearance.

Three miles north of this city we reached the Tuh-keaou-ho on the morning of the 28th. This is the second branch of the stream formed by the union of the two branches of the Tae-ping-ho, and passes north of the district city of Sin-han. Flowing eastward, it passes the district city of Kin-tang, and, uniting with another stream, enters the Tó as an affluent from the north. Two or three miles beyond is the Tseen-shwuy, the third branch of the stream formed by the union of the two branches of the Tae-ping-ho. This passes south of the district city of Pāng, and forms the boundary between the district of Sin-too and department of Han. Flowing eastward, it passes the city of Kin-tang on the north and east sides, and unites with the Tuh-keaou-ho, forming an affluent of the Tó. Immediately north of this stream stands the town of Heang-yang-chang, at the other end of which is the Tsing-pih-keang, a branch of the Tseen-shwuy, which flows east to the Meen-yang River. There is a fine level bridge roofed over, forming a long arcade. The Me-mung-shwuy is a tributary to the waters of the Tae-ping-ho, from the north, near the point of divergence; and the Ma-shwuy-ho is a river branching out from that tributary, which passes north of the district city of Pāng. This we crossed by a long level bridge of about twenty arches, at the town of Se-ching-keaou, three or four miles north of the Tsing-pih-keang. Flowing eastward it unites with the last-named stream; and this is the last of the system of interlacing waters joining the Min and the Tó. Six or seven miles further on the road brought us to the departmental city of Han, a busy, and apparently prosperous place, with some handsome temples and good shops. Eight miles beyond this city is the Meen-yang-ho, a river rising in the north-west of Meen-chuh district, and forming the northern boundary of the Ching-too Plain, which we crossed in a ferry-boat in the morning of the 29th.

On leaving the capital we found a good broad highway, but at a few miles' distance it narrowed down considerably, and in some places it was little better than a footpath. A vast concourse of people thronged the road on our first day's journey, but the numbers diminished as we receded from Ching-too. There were pedestrian travellers of the humbler class by far the most numerous; while those in easier circumstances were borne in sedan chairs; heavily-laden mules, and coolies with their ponderous burdens suspended at the ends of a bamboo pole, made up the bulk of the traffic. Our own party travelled in chairs with coolies to carry our luggage.

Much the largest proportion of the land was occupied with rice, and occasional fields of maize, sorghum, and *Kaou-leang*, a grain from which spirit is distilled. The bamboo was abundant, but forest-trees were rare and fruit scarce. A few pears and apples of an inferior kind, crab-apples and greengages, formed the principal articles exposed by the dealers; but vegetables were to be had in great profusion and variety. Agriculture was in a flourishing condition, and the population generally bore an appearance of comfort.

After crossing the Meen-yang-ho, we began to ascend rising ground, and found the cultivation diversified with the ground-nut, sweet potato, tobacco, and other plants requiring less water. On reaching the ridge of the first hill by a gentle rise, an agreeable view burst upon us; on the right lay a fertile valley, and, round in the south-west direction, ranges of low hills and undulating ground, all richly cultivated. Continuing the ascent by a moderate gradient,

a mile or two brought us to the *Pi-ma-kwan*, or "White Horse Pass,"* a spot famous in early history. This is a large walled enclosure on the summit of the range, planted with cypress trees, and entered by a gate which bars the highway. The chief and almost only object of note inside, is the mortuary chapel and tomb of Pang Tung, one of the heroes of the Three-kingdoms period (3rd century), who was killed near this site. The building is large and handsome, being kept in a state of order and cleanliness not commonly met with in similar establishments. The first hall from the entrance contains the effigies of Pang and his friend Choo-ko Leang side by side. The hall behind has the single image of Pang Tung, and a courtyard at the back contains the hero's grave, a circular mound with a low stone wall round it, out of which grow some fine old specimens of the weeping cypress. The whole establishment was restored in 1697, and a gravestone erected, bearing the inscription, "The tomb of Pang Sze-yuen, Pure Marquis, of the Han dynasty." Many ancient tablets of bygone dynasties decorate the building.

Looking down from the hill, on the farther side, an interesting landscape met the view; a succession of eminences stretching away to the distant horizon, covered for the most part with crops of varied produce, and dotted over with villages and hamlets, while here and there a city or town of greater pretension formed a focus for several converging lines of traffic; and two or three watercourses meandering through the lower grounds served to fertilize the adjacent fields, at the same time that they gave a pleasing relief to the pictures, as they came in view at intervals in the rural scene. A steep and narrow path led us into a valley, where two or three miles further brought us to the district city of Lo-kwang. The small portion of the city we passed through was quiet and

* I cannot help thinking that this is the place spoken of by Marco Polo in the following passage:—"This journey of twenty days towards the west being performed, you arrive at a place called Ach-balnch Manji, which signifies the white city on the confines of Manji, where the country becomes level, and is very populous. The inhabitants live by trade and manual arts. Large quantities of ginger are produced here, which is conveyed through all the province of Cathay, with great advantage to the merchants. The country yields wheat, rice, and other grain plentifully, and at a reasonable rate. This plain, thickly covered with habitations, continues for two stages, after which you again come to high mountains, valleys, and forests."—(Wright's edition, p. 250.) Wright confesses himself unable to identify the locality of Ach-balnch. Pauthier takes it to be the ancient town of 白公城, *Pih-kung-ching*, on the north of the Han. Klaproth thinks it was a place called 白馬坡, *Pih-ma-ching*, near the district city of Meen, on the Han. But the distance to these places does not at all agree, as it would make twenty-three days' journey from Se-gan-foo to the Han; whereas that is just about the time required to the "White Horse Pass," at the primitive slow rate of travelling. The position of the White Horse Pass appears to me perfectly to satisfy the conditions of the statement. The twenty days' travelling over the mountains, and sudden arrival at the plain, with all the other details, might serve for a description of the country at the present day. Although there is no town there now, there is reason to believe there was one in Polo's time, for within a century after, at the commencement of the Ming, we know that there must have been one of some importance, as a superintendent inspector was then placed over it. We do not find the word *Ach*, for "white," in the Mongol language now, the equivalent being *chakhan*; but we have no dictionary of that language so old as the Yuen dynasty, since which it is probable considerable changes may have taken place. The natural process, then, is to look for it in some cognate dialect, and we find it accordingly in the Turkish آق *Ak*, with the same meaning, this dialect being one of the most nearly allied to the Mongol.

comparatively clean; but the suburb where we made a short halt was a scene of great activity, from the concourse of travellers; and the numerous houses of entertainment full of life and bustle, appeared to be driving a lucrative trade. From this point we coursed along the south bank of the Lang-shwuy-ho for a mile or two, and then crossed it by a long low bridge, about three feet wide, with no parapet. This rises in the west of Lo-keang district, and after a south-easterly flow of about a hundred and thirty miles, in the course of which it passes the district cities of Lo-keang and Chung-keang, and the prefectural city of Tung-chuen, it enters the Pei-keang, and thus opens up a direct communication with Chung-king. There is said to be a connection between the head-waters and the Meen-yang river. A footpath of about a mile brought us to the Hih-shwuy-ho, somewhat narrower than the preceding, into which it flows at nearly a right angle. The source appears to be rather more distant, and the two channels run nearly parallel for the greater part of their length. This we crossed by a bridge similar to the preceding. There are a good many water-wheels on the left bank for the purpose of irrigation, some between 20 and 30 feet in diameter, similar to those we had seen in great numbers before reaching Ching-too. From this the road begins to ascend again, and after passing two villages we arrived at the town of Kin-shan-poo, where we put up for the night. This is a very busy place, but the houses and shops have a mean appearance. Here we began to be subjected to the inconvenience of crowds round the door of our lodging-place, but it was merely the result of curiosity; a feature, however, of which we had seen but slight indications hitherto in Sze-chuen.

On the morning of the 30th we entered the department of Meen, and during the day passed through several poor little villages and hamlets, with nothing very notable. Just beyond the village of Shih-keaou-poo, a handsome stone portal crosses the road, soon after passing which our route lay alongside the Cha-ping-ho, a rapid river, red with mud from the heavy rain during the past night. This rises at Cha-ping-shan, some hills in the western part of the district of Gan, and, flowing in a direction nearly east, passes south of the district city, and enters the Pei a little to the south-east of the departmental city of Meen. Skirting this stream for a few miles, we crossed in a ferry-boat, and a short distance beyond crossed the Pei River to the left bank, but soon after recrossed to the right, and entered the north gate of the city of Meen. There we found troops quartered, who were on their way to engage the Mohammedan rebels in Shen-se.

The following morning we again crossed the Pei, running with a very swift current, about half a mile from the city; and keeping down the left bank for a mile or two in an eastern direction, we crossed the Tung-ho by a stone bridge. This is a tributary of the Pei rising toward the north-east. Our day's journey took us through a number of poor and insignificant villages, with a military guard station generally about every four or five miles. These are easily distinguished by the rude attempts to depict some of the sons of Mars armed cap-à-pie, of gigantic dimensions and in gaudy colours, on the whitewashed walls, while a rusty spear or two may occasionally be seen at the door; and an official is said to be attached to each, whose services are sometimes required to forward a despatch. These stations are found throughout the greater part of China, at least the northern portions; and are ostensibly intended to furnish escorts to travellers whenever demanded: but such an appendage on the road we were travelling would have been an utter superfluity. At many of the stations, three or five turrets, representing the old smoke telegraphs, still remain, but it is almost needless to say, they merely stand as symbols of the past. The road is hilly, with some steep ascents and descents. Half a mile beyond the small town of Yew-hoang-poo, a seven-story pagoda stands in a valley on the north side of the road. Some of the valleys are very pretty, and the weeping

cypress grows there profusely. The wax-tree is also found, but rarely with the producing insect on it. Small patches of cotton were seen here and there. We stopped for the night at Wei-ching, a busy town of considerable size, surrounded by a stone wall, the day's route having taken a much more easterly bend than on previous days.

Just beyond Wei-ching, an insignificant stream flows east into the Tsze-tung-ho; and, at a distance of 10 miles, we reached a small stream dividing the department of Meen from the district of Tsze-tung, which flows south, and after a few miles joins the Wei-ching watercourse, when the united waters enter the Tsze-tung-ho. Less than 2 miles further we came to the small town of Shih-neu-poo, or "Stone Ox Stores," which takes its name from a natural stone formation on the top of a neighbouring hill, said to resemble a perfect ox. The road still lay along a succession of hills of no great height and sparsely wooded, but cultivated to a considerable extent with the taro or sweet potato, and occasional spots of rice on terraces. About half a mile before reaching the city of Tsze-tung, a good stone bridge took us across the Tsze-tung-ho, a rather wide and rapid river which rises in the northern part of the district; after receiving several tributaries in its southward course it enters the Pei, making a flow of 160 miles or more. The site of the city may be distinguished at a great distance by a tall white eleven-story pagoda, which stands outside the wall.

Having spent the night in the city, our path next morning lay up a gentle ascent, and at a distance of 3 miles or more we passed a celebrated well, named the Koo-keen-tseuen, or "Ancient Sword Spring," famed for its medicinal virtues. A stone tablet by the side states that to have been formerly one of the most difficult and dangerous passages on the line, till a road was made by public subscription about the beginning of the present century. Three or four miles further, ascending a hill by a long flight of stone steps, we reached the mountain village of Keih-hesng-poo, the reputed birthplace of Wan-chang-te, a Taouist celebrity, idolized as the god of literature. A very large and handsome temple to his honour is erected on the slope of the hill, the receding apartments of which are ascended by successive flights of steps. Of course the principal hall is dedicated to Wang-chang, who is there enthroned in state; but several other idols have their shrines in the adjoining apartments. To the right of the main building, a smaller one contains an effigy of the hero seated on his mule; and the attendant priest points to an opening in the rock behind the figure, which he says is the mouth of a subterranean passage, through which Wan-chang was accustomed to make a journey on his mule to the province of Shen-se and back daily when on earth. By permission I got up to examine the hole, and found it scarcely big enough for an ordinary man to crawl into, to say nothing of a mule; but he was ready with the reply, that as no one had passed through for so many ages it was gradually contracting. Several attempts he said had been made in former times to effect a passage, but every adventure had been repelled by strong gusts of wind. The various members of the family of the sage are enshrined in a building higher up. In the centre shrine are his father and mother, and in a smaller one above it the effigy of his grandmother; on the right are the sage and his wife, and on the left his sister. Along the right end wall are his six sons; and against the opposite end, his four daughters and two daughters-in-law, one with a baby at her breast. On the opposite side of the road a flight of steps up a mound leads to a shrine, where he is represented in a reclining posture. Still higher up is a small building, containing nothing but a stone couch with some sculpture on the front, which is said to be the veritable article on which he slept. Adjoining this building is a square stone enclosure, with an old cypress-tree inside, which is pointed out as the tree to which he was accustomed to tie his mule. The local legends about this worthy are very numerous, and few of the Taouist in-

ventions have gained a wider celebrity than that of Wan-chang. The many minature pagoda-looking structures that are seen all over China are dedicated to him. These are especially numerous in Sze-chuen, and also in Canton province, where they are called Wan-ta or Menta. The Taoists look upon him as the material impersonation of a constellation in the northern hemisphere, which bears the same name, and the six stars of that constellation are frequently symbolized by the hexagon form of the turrets. His recorded biography gives his family name as Chang, and the date of the second century of our era. He is said, however, to have had many incarnations; and there is a small exhortation to virtue, the Yin-chih-wan, which has been handed down as his production, in which such a statement is put prominently forward.

About 7 miles beyond this famous temple we came to *Shan-ting-poo*, which struck me much at first sight with its resemblance to a Swiss mountain-village. The inhabitants in that region are sufficiently poor, and provisions we found scarce. Little was to be had but hard cakes, made of coarse flour and water, besides cucumbers and several other items of vegetable diet. Their tea is one of the most detestable of beverages, and in other circumstances would be unrecognizable to a European palate. These remarks do not apply peculiarly to the village in question, but are common to the route for many days' journey; and this is perhaps the more remarkable as the inhabitants depend in a great measure for their livelihood on supplying the wants of travellers. Such is the hardihood and frugality of these mountaineers. Here for the first time since leaving the plain, we found mules largely employed as beasts of burden; and it required some little skill for our chairs to thread their way through the droves, as we passed up the narrow street where they were halting for their feed. A little beyond this we began to meet with coolies carrying huge packs on their backs, after the manner so picturesquely described by the Abbé Huc. They carry a staff in the hand, by means of which they frequently rest in the road, placing the staff under the pack behind them, to relieve them of the weight as they stand to take breath. We found the tree-insect wax produced on a small scale in the neighbourhood of the village of Yung-woo-poo. Towards evening we reached our halting-place at Woo-leen-yih, after crossing the Se-ho. This river rises among the Woo-tsze hills, in the north-west of the department of Keen, and after a course of about 140 miles, receiving two tributaries on the way, it enters the Kea-ling-keang, the direct course to Chung-king.

On August 3rd, after a detention of several hours on account of the rain, we commenced the ascent of a steep hill by a zigzag road. A little beyond the summit is a memorial chapel to Choo-ko Leang by the roadside, and this is but one of some tens, perhaps hundreds, dedicated to this hero, to be found in Sze-chuen, so great are the posthumous honours conferred on him. About 12 miles from our starting place we came to Lew-she-kow; a busy little town, just beyond which a stone bridge led across the Lew-kow, a small river tributary to the Se-ho. Arrived at the village of Chow-ya-tsze, we made a very steep descent into a valley, where a pagoda on a neighbouring hill comes in view, looking down upon the departmental city of Keen. Within 2 miles of the last-named village, a winding and picturesque path led us up to the city, which lies on a declivity, and is closely surrounded by an amphitheatre of steep hills. The wall is in good condition, but there is only one street through the city of any consequence, and a great part of that is poor. The people were very peaceable and friendly. The hills over which we had been travelling most of the day were of moderate height, formed of red sandstone in horizontal strata, with conglomerate cropping out in places, and cultivated in terraces to the top, millet being the principal produce. There is a good stone road the greater part of the way from the district city of Tsze-tung to Keen-chow and a

considerable distance beyond; and the outline may be traced far off by a double line of weeping cypress-trees occurring at intervals; sometimes only one or two together, but in many places forming quite an avenue of fine old specimens. These were planted and the road made by Le Peih, the governor of Keen-chow in the early part of the sixteenth century, so that many of the trees have gone to decay.

Our progress through this country was slow and tedious according to European notions. We had stipulated, on leaving Ching-too, to reach the prefectural city of Hanchung in fourteen days at the outside, and we were anxiously counting the days as we advanced from stage to stage. Not only was the want of provisions and suitable accommodation rather trying to our European constitutions; but there was the further risk that by delaying on the way, we might be overtaken by the rainy season, when several of the streams that we had to pass would become so swollen as to be impassable for days, and perhaps for weeks; a disaster we wished by all means to escape. Under these circumstances we had been several times irritated by the attempts of our coolies to procrastinate on the way. These men belonged to a hardy race, who possess few of the comforts of life, and care little for them. Their great vice is gambling, to which they are passionately addicted: and for the gratification of which they do not scruple to sacrifice the interests of themselves and their employers. Several times had this proclivity come into collision with our determination to speed on the way, and on the morning of the 4th we came to a dead-lock, by their absolute refusal to move that day. Our only resource was an appeal to the civil power; we were courteously received at the office of the magistrate, and the requisite pressure being put in force, our coolies trotted off with their respective burdens with as good a grace as might be expected. Leaving the city by the east gate, we crossed the Keen-shwuy by a bridge. This small river is formed by the junction of two branches, and enters the Kea-ling-keang, after a course of between 30 and 40 miles. During the after part of the day we had several abrupt ascents and descents, but passed no place of importance till we reached Keen-mun-kwan, our halting-place for the night. This is a busy town and a place of considerable celebrity in early history. We were now at the foot of the Ta-keen-shan, a range of lofty hills which had been in distant view for several days past. They are quite different in character from those over which we had been travelling for a week. The general direction of the range is north-east, with spurs branching out southward. The southern declivity is inclined at about 30°, and covered with verdure, but not cultivated. The crests are serrated in the most grotesque forms, and the northern sides have the appearance of being abrupt precipices. They extend away, range beyond range, till lost to vision. The Wor-tsze or "Five Sons" hills had been in sight for two days past, in a north-westerly direction. These are five remarkable conical peaks of similar outline; four of which appear exactly the same height, and are stated in the topography to have an altitude of 5000 feet, but I do not think they are near so much.

Next morning, following the course of a small stream, named the Keen-mun-shwuy, we soon reached the sombre pass of Keen-mun, an opening in the range of hills less than a hundred yards wide, with precipitous cliffs on either side, the greater part conglomerate, overlaid by sandstone, with some thin strata of the same at intervals. A little way in, at the foot of the eastern cliff, are a number of memorial tablets, which doubtless contain records of interest, but time would not admit of our stopping to examine them. The ancient name of the road through this pass is the Shih-new-taou or "Stone Ox Road," and carries with it a curious tradition to the following effect. In the fourth century B.C., this mountain range formed an impassable barrier between the kingdom of Tsin on the north, and that of Shuh on the south. The King of

Tsin, meditating the conquest of Shuh, was induced to resort to artifice to aid him in his project. Aware of the avaricious propensity of his southern neighbour, he caused five stone figures of oxen to be made, and every night had a quantity of gold secretly scattered on the ground below their tails; till the report gained currency that this was the ordinary excrement of these miraculous animals. Their fame having spread to the kingdom of Shuh, the cupidity of the prince was excited, and he expressed a wish to be the possessor of the wonderful oxen. This desire reaching the ears of the King of Tsin, he gracefully offered them in a present. But then it was necessary to make a road through the mountains for their transport, and the cutting in the Ta-keen-shan was made for this purpose. The breach in the hill once effected, the King of Tsin soon followed the oxen with a large army and subjugated Shuh, the prince of which thus fell a victim to his own avarice.

Towards the middle of the pass the road runs under a building called the Keen-kŏ, the modern representative of an ancient pavilion, built by Chou-ko Leang, which carries the memory down to the third century of our era. The ground story is surrounded by a battlement, and there are two stories above it. Once through the breach in the loftier range, we found ourselves in a valley surrounded by ragged and barren declivities, in some places perpendicular heights; and after continuing our route for a mile or two, the gradual ascent and descent of a lower range, brought us, at a distance of 10 miles, to the village of Ta-muh-shoo. Near this are several remarkable rugged peaks standing out prominently, high above the general outline; and one of these, with a large temple on the top, forms a very conspicuous object, which we passed very close to, a mile or two after leaving the village. The Keen-mun stream was visible in the valley below us along a considerable part of the day's journey. This unites with the Hwang-shŭ-keang, a river rising among the Mo-tsun hills, on the border of Shan-se province, and flowing east for more than a hundred miles, after receiving several tributaries, the united waters enter the Pih-shwuy River. Cultivation was much more sparse than in the previous part of our journey; the villages and hamlets were wretched enough, and the people miserably poor.

A few miles more brought us to the New-tow-shan, a conspicuous hill, from which we made a steep descent, with the district city of Chaou-hwa in sight in the valley below. The Kea-ling River is seen winding round the east side, and there, for the first time since leaving Ching-too, we found cargo-boats struggling up against the current; so that the passage by water may be made between that city and Chung-king, passing the prefectural cities of Paou-ning and Shun-king on the way. The Pih-shwuy-keang, one of its chief tributaries, is seen entering on the north side of the city. This rises in Tartary, and after a course of 1800 miles enters the province of Shen-se, where receiving some very considerable affluents, it enters the district of Chaou-hwa, and unites with the Kea-ling within a mile of the city.

We made but a short journey on the 6th, from the city of Chaou-hwa to that of Kwang-yuen, about 14 miles, with little worthy of note on the way. About a mile from the former city, where we crossed the Kea-ling River, there is a strong rapid, by which even the skilled ferrymen are sometimes carried away beyond their calculation. The road for the greater part lay along the foot of the hills skirting the river. Within two miles of Kwang-yuen, we entered on a small alluvial plain, and made our way through fields of maize to the Taou-pa, a small river rising on the north-east, locally called the Nan-ho. Crossing this by the ferry, we were immediately in an extensive and busy suburb, where we put up for the day outside the west gate. There is a lofty cliff on the opposite side of the river, with four huge chambers excavated in it. These I was informed had been inhabited in ancient times, but could not get any definite information on the subject. A little to the north is a

small excavation, said to have been the shrine where the empress Woo-tsih-teen, of the Tang dynasty, worshipped; and a white building close by, named the Soo-se-low, is pointed out as her habitation when a Buddhist nun. There is a camp on the north side of the city, which rendered it desirable that our stay should be as short as possible, but no persuasion could make our coolies go farther that day; and it was only after some litigation that we could get them away on the next.

Some 3 or 4 miles from the city the following morning, we were at the village of Tseen-fuh-yae, or the "Thousand Buddha Precipice," which derives its name from the cliff immediately beyond, this being one of the most remarkable pieces of Buddhist sculpture in China. Probably the number indicated in the name is no over-estimate, for there would seem to be a shrine to almost every idol in the Buddhist pantheon. Some are in small recesses cut only a few inches deep; others are in caves capable of holding several people, and at one of such a flight of stone steps conducts to the entrance. Every available spot from the highest pinnacle down to the ground seems to be covered, and the names of the principal idols are placed over them. In ancient times, the cliff here rose abruptly from the river, and had a wooden stage suspended to it, by which the transit was effected; but during the Tang dynasty, Wei Hang had a road excavated—a work of great utility, which he supplemented by the highly decorative assemblage of idol shrines, which are supposed to afford a peculiar sanctity and security to the place. I was gravely informed that a golden boat lies embedded in the river just in front, and may be seen occasionally. Possibly the peculiar appearance of the particles of mica at times, may have given strength to the legend. About midday we reached the village of Sen-kea-ho, divided by the river into two parts, the largest portion being on the west side. This is entirely dependent on the coal trade, there being extensive mines in the neighbourhood. The price of good coal at the wharf there is about 8s. the ton. Continuing by a rugged rocky path till we came to the Too-mun Hill, we there deviated from the river-bank for a little, and ascended a steep and narrow path to the hamlet and pass of Fei-seen-kwan on the crest of the hill, where there is a barrier gate in an embattled wall. On the north-east of the pass is a steep pyramidal-shaped, and almost isolated hill, named Wei-fung-shan, with a temple to the ancient sage Shun on the summit. Round this the river makes a circuitous bend, and on emerging from the pass, we find it again flowing past almost beneath. With the exception of this little bend, our path all day lay along the bank of the Kea-ling River; and towards dusk we found the stream suddenly contracted within very narrow limits, between precipitous banks. Overtaken by darkness, we found it necessary to halt for the night in a very miserable village, with accommodation scarcely above zero.

On the move at a very early hour next morning, 8 miles over a rough limestone path, brought us, ere the sun was well above the horizon, to the Chaou-teen-kwan, a pass on the top of a hill named the Chaou-teen-ling. A temple covering both ends of the double gateway, with a connecting wing on the east side, contains the effigies of a number of canonized historical personages of the Three-kingdoms period. There is a fine gorge in the river close by, called the Ming-yue-hea, or "Bright Moon Gorge." The descent from the pass is by a long and in part precipitous zigzag road, which led us to the town of Chaou-teen-yeh. Passage-boats come up from the city of Kwang-yuen to this place in a day, and go down in much less time. On the north of the town, the Tseen-shwuy, a broad shallow stream which comes down from the borders of Shen-se, enters the Kea-ling River. After crossing this there was a steep and wearisome ascent of a couple of miles; but on reaching the summit, the road lay along the declivity for 5 miles more, through a landscape of singular beauty, till we stopped at the Lung-mun-ko, an open shed and gateway across

the road, occupied by vendors of comestibles. A very little to the west of this is a natural curiosity of a rare and curious character. A precipitous limestone cliff, near a thousand feet high, has a natural tunnel under it, called the Lung-tung, about two hundred feet high at the mouth, but suddenly contracting to much smaller dimensions. Here the Tseen River enters and becomes lost to view, giving forth a sound like the rush of some great cataract. Passing under the hill, it emerges again some 2 or 3 miles lower down, and enters the Kea-ling on the north of Chaou-teen-yih. This river is mentioned in the "Tribute-roll of Yu" in the "Shoo-king," thus:—"The To and the Tseen were conducted by their proper channels." The Tseen is but a small stream compared with the Kea-ling, but it may have been larger in ancient times. My companion picked up some fossils at the entrance to the cave. From this a tortuous and hilly road led us by a very abrupt descent, just about dusk, to the bank of the Tseen River again, which our coolies forded without difficulty. The local name of the river there is the Yen-kea-ho, where it forms a great bend, nearly three-quarters of a circle, in the loop of which stands the town of Keaou-chang-pa, our halting-place for the night. It is a very quiet retired spot, with scarcely any business doing except on market days, which occur nine times in each month. It is entirely surrounded by high hills, with a dark rugged range appearing above the others away to the east. The river is clear as crystal, with a stony bottom, and convenient places for bathing.

Having spent a day at Keaou-chang-pa, we were on the way by moonlight on the morning of the 10th August, and before daybreak crossed the boundary between the provinces of Sze-chuen and Shen-se, at the Tseih-pwan Pass. A solitary priest was already at his matins by the light of a lamp, the monotonous clang of his sonorous pot, as he sat by the gate, calling upon passing travellers to contribute to the cause. As the light of day burst upon us, it revealed a scene of romantic grandeur, through which we were clambering up and down steep and rugged pathways. During the day we passed through several poor villages, and early in the afternoon arrived at the departmental city of Ning-keang, the first we had come to in Shen-se. The place appeared to be excessively poor, with scarcely any trade. The Pih-yen River takes its rise from a mountain-stream in the vicinity of the Tseih-pwan Pass, and flows north-west of the city, where it is joined by another stream from the north, along which our route lay. The united stream then flows north-east, and, after receiving a tributary from the south, disembogues into the Han.

A great fall of rain had taken place during the night, and it continued till the afternoon of the 11th, when it was most difficult to get our coolies to move, as they declared the river so swollen as to be unfordable. Having ascertained, however, that there was still a chance, we felt that the urgency of the occasion demanded every effort; for, should the rain continue, the case was becoming worse every hour, and we might be detained for many days. At length we succeeded in getting on the way, and though the rush was coming down with considerable velocity we were still able to manage it. The road, if it can be so called, lay up a narrow ravine, cut off alternately on either side by steep rocks, so that we had to ford the stream about ten times and got most of our baggage drenched, coming to a halt at Woo-le-po, a mountain village, scarcely 7 miles from the city.

Next morning the water went down as rapidly as it had risen the day before, and there was no difficulty in fording the stream dry-shod; for some part of the way our path lay in the bed of the current. A few miles on the road we reached the Woo-ting-hea, a gorge in the mountain, named after the five stone-oxen which the King of Tsin presented to the King of Shuh. On ascending a hill a short distance beyond, a stone tablet records the fact of that

being the road that was opened up for the occasion; and about a mile farther is the Woo-ting barrier, adjoining which is a small village, called the Kin-nan-yih, or "Gold Ox Station." Continuing the journey through a narrow defile, we come to the Han-yuen-kow on the left, an insignificant stream, which our coolies walked over without any trouble. This is the source of the great River Han, and rises at the Po-ch'ung hill, only a few miles to the west. This is alluded to in the "Tribute-roll of Yu" thus:—"From Po-ch'ung he surveyed the Yang, which, flowing eastwards, became the Han." This, then, is the ancient Yang River. Two or three miles beyond we stopped for the day at the garrison-town of Ta-gan, where there are three camps, with some 1000 to 2000 troops. There is a tributary stream there, the Ta-gan-shwuy, half as large as the main channel, which is crossed by a wooden bridge and discharges its waters on the south-east of the town.

Our journey on the 13th lay along the left bank of the Han, and, as there had been a heavy fall of rain, the mountain-currents were much swollen and there was some difficulty in fording them. A rather formidable one flows through the village of Tsing-yang-yih, and 5 miles further is a broad and swift-flowing stream, immediately beyond which we halted for the day at the village of Tsae-pa.

Having now reached the highest point of the river to which boats ascend, next morning we took passage by water for the prefectural city of Han-chung, such being less laborious and more expeditious than chair-travelling. At about 6 or 7 miles' distance the waters of the Meen-shwuy, flowing in from the north, unite with the Han at a spot called Tsin-kow. This river is formed by the union of three confluents, and appears larger and swifter than the Han where the two unite. Three miles lower down are some abrupt cliffs on the right bank, and 5 miles more brought us to the district city of Meen on the left bank. The wall was in very good condition, but the whole enclosure seemed to be one great field of maize, some five or six huts being the only human habitations. The whole population, including the official establishments, is collected in a large suburb on the east side, enclosed by an earth-wall, which is now a ruin. The city was founded by the renowned Choo-ko Leang, whose grave is situated 3 miles to the south-east at the Ting-keun hill. During the summer floods, when the gorges on the Yang-tsze are almost impassable, it is customary for native merchants to reach Sze-chuen *viâ* the Han; and, having reached this point, they take mules to cross the hills, about 40 miles, to the Kea-ling River, by which there is a direct communication with Chung-king and the principal places in the province. From the city of Meen eastward the hills recede from the river, leaving a level valley of several miles in width, which extends some distance beyond the city of Han-chung. Hwang-sha-yih is a considerable town on the left bank, 2 or 3 miles below the city, standing back about a *le* from the river. A few miles below this a stream runs in from the north, and a little way beyond the Pih-yen River, from Nin-keang, discharges on the right bank. Ten or 12 miles further, the Hih-lung-keang, a large river, enters the Han on the left bank. This rises from two sources on the west side of the Tae-pih mountain, on the southern border of the district of Mei, flows east and then south, receives a number of tributaries, and passes the district city of Paou-ching, discharging its waters after a course of 170 miles. The Ke-tow Pass is seen, far away to the north, on the summit of a mountain range. Overtaken by thick darkness and heavy rain, we came to a halt within a few miles of the prefectural city.

The rain continued during the 15th, and prevented any extensive perambulations through the city, which seems to be of moderate size, with nothing very imposing in the streets. A tolerably extensive suburb separates it nearly a mile from the river on the south, and there is a much larger one outside the

east gate, enclosed by a mud wall, now almost demolished.* We had hoped to hire a boat there to take us down to Laou-ho-kow, but none of the boatmen were willing to start till after the 1st of the Chinese month, which would be four days; and it depended on the state of the river whether they would move then, for they said there was a gorge 30 miles long, which they dared not risk unless the water fell several feet. Ascertaining, further, that the road by land to the eastern end of the gorge was much shorter, and that boats were to be got there, we decided on continuing our journey by chairs as far as the town of Cha-chin.

Having settled all preliminaries for a chair-journey, we left Han-chung in the forenoon of the 16th, and travelled all day over a flat country, chiefly occupied by fields of rice and maize. At a distance of 8 miles from the city we crossed the Han in a ferry-boat, the river there being about 300 yards in breadth, with shallow slope on the left bank and a deep channel and swift current on the right. Eight miles beyond this we arrived at the Nan-sha-ho, a tolerably broad, shallow river, rising in the south, which our coolies were just able to ford, the chairs dipping slightly in the water. Two miles further on we put up for the day at the small village of Tseih-li-tsen, where a festival of several days' duration was in process. The peasantry from the neighbourhood were gathered together in their holiday attire, the great object of rustic attraction being a theatrical performance with wooden puppets. One unlucky wight was chained to the stage all day, doing penance for his master, who had refused to contribute his quota towards the fête; but he appeared to bear the penalty with the philosophic resignation of a martyr. The only house of entertainment for travellers was crowded to overflowing and the one private chamber was allotted to us, but it was scarcely equal, in point of comfort, to a respectable coalhole. We had to wait till the company dispersed, to get some boards on which to manufacture sleeping-places. This, however, was not much of an exception to many of our lodgings, but may be rather taken as a sample of the majority.

Next day we made 30 miles, mostly over hills, passing several villages and hamlets on the way, and stopped for the night at the small town of Sha-ho-kan. Our route, for a great part of the day, lay in the neighbourhood of the Ke-leaou-shan water, a tributary of the Sha-ho, which runs through the above-named town. The Sha-ho rises at Low Hill, in the north-west of Se-heang district. Paper is manufactured among the hills not far distant, which gives rise to a good deal of traffic. Our hotel accommodation was inferior, if possible, to that of the previous night.

Seven miles over the hills next morning brought us to the village of Koo-chuh-pa, where a stream from the east of the Koo-yuh Pass enters the Muh-ma River; and 3 miles lower down we halted at the town of Ma-tsung-tan, on the left bank of the latter. This river rises at Me-tsang Hill, in the south-west of Se-heang district, on the border of Szs-chuen province, and, flowing north-east, enters the Yang on the east of the district city. Taking a boat at Ma-tsung-tan, we floated down rather rapidly with the current for 17 miles to the city. This seems to be a busy, thriving place, and there is a considerable suburb on the south side. Entering by the east gate, we left by the north, and scarcely a mile beyond our men forded the river, opposite the village of Tung-too-kow. Passing another village, we soon crossed the Yang in a ferry-

* This appears to be the capital of the country named by Marco Polo *Cuncun*, or *Cuncun* (Han-chung), where he says:—"We will now take leave of this kingdom, and give account of a province abounding in mountains which is called Cuncun, and is a very wearisome road to travel. . . . And at the end of three days one meets with lofty mountains and great valleys, which pertain to the province of Cuncun."

boat. This river rises in the south-east of the district of Se-heang, among the hills to the north of the Yun-chang Pass, on the border of Sze-chuen, and, flowing north, receives the waters of the Muh-ma and another affluent before it enters the Han. Four miles farther on we stopped at a solitary house on the top of a hill, our coolies absolutely refusing to go farther that night; so our whole party of twenty-four persons, besides the family, including pigs, fowls, and dog, had to put up in a common apartment—and that not a very large one either—except that three or four of the coolies stowed themselves away in a closet too begrimed with dirt and loaded with dust for us to venture in. For the past two days we had had a range of lofty hills in view on the north, bordering the Han, and now we were rapidly approaching them. During the day we passed a number of the large water-wheels used for irrigating the fields by raising water from the stream to heights of 20 or 30 feet. There is a very accurate description and representation of these machines by Staunton, in his narrative of Lord Macartney's embassy.

On the 19th we were on the way at an early hour, and at a distance of 15 miles reached the small town of Fih-meen-hea, at the further end of a valley completely enclosed by high hills. Beyond this there was not even a village for 14 miles, till we reached the town of Cha-ke-chin, or, as it is commonly called, Cha-chin, on the Han. This stands on the left of the embouchure of the Yang, which is also called the Cha-ke, that being the name of a tributary flowing in from the south. Cha-chin is a poor little place built on a point of rock, and there we had expected to get a boat to take us on our way, but had the mortification to find they had all been taken away that morning for the Government service. Fortunately, however, a boat came up in the evening with passengers, and we engaged it to take us down to the district city of Shih-tsenen the following day. Our road all day had been through mountain-ravines and over hill-tops, embracing some fine scenery. Much of the path was bordered by the date, walnut, Tung-oil,* and a variety of other trees. The rocks are limestone, and near the Han the strata are perpendicular. The cottagers by the wayside were engaged in the silk manufacture.

The current carried us rapidly down the stream, making the passage of 20 miles in three hours, or less. The course nearly all the way was between abrupt hills, with occasional precipices; and in some places the river is confined within a very narrow channel. There are two rapids in the interval caused by reefs. About midday we came in sight of the district city, and soon anchored against the western suburb, which is rather extensive, but poor in appearance. The Chin-chow River rises at the Yun-woo Hill on the north, and joining the Heang-taze River from the north-west, enters the Han, a little to the west of the suburb. The city is built on a red sandstone rock; and there is a spring of deliciously clear and refreshing water just under the southern wall, from which the city derives its name, "Stone Spring." The place within the walls is small, and has one busy retail street from the east to the west gate. The market is but poorly supplied with vegetables, fruit, and meat. We found a number of boats lying at anchor there, but most of them were retained for the Government service. After some ineffectual negotiation among those that were at liberty, the city magistrate, who was very friendly towards us, gave up one of the boats he had sealed, and arranged for our passage to Hankow, to the mutual gratification of the boatman and ourselves.

It was well on towards midday on the 21st before the skipper got all things ready, and by the time we started the water had begun to rise. The wind

* Blakiston gives the botanical name of this as *Elæococca verrucosa*. See 'Five Months on the Yang-tsze,' p. 137.

sprang up soon after, and at a distance of 10 miles, while threading our way through a narrow and tortuous pass, just below the village of Leen-hwa-shih, the boat was carried off by the current, the men lost command, and it was borne irresistibly on a granite reef, known by the name of the Foo-paou-shih. The result was a considerable opening in one of the joints at the end, and the water began to flow in rapidly. By dint of caulking, however, this was pretty well stopped. The wind increased, and the water came down with a sudden rush, raising the river in that part some ten feet in three or four hours. Although the rock on which we struck was nearly four feet above the water, yet so rapidly did the water rise, that we might have passed over the same spot two hours later with impunity. Such fluctuations are doubtless caused by the fall of rain swelling the numerous tributaries towards the head-waters. Seven miles lower down, the Choo-ho, coming from the Ma-hwang Hill on the north, disembogues into the Han. A little below the village of Yew-tung-kan we passed through a gorge with a heavy surge; and eight or nine miles beyond, after passing a stream on the left, stopped for the night at the village of Mei-hoo on the right. There is a strong rapid opposite this place. A good deal of silk is produced and manufactured in the neighbourhood.

On the 22nd we were detained till the afternoon, while a carpenter was repairing the damage of the previous day. Soon after moving, we passed several strong rapids, and the water had become excessively muddy. A number of fortresses appeared on the hill-tops in the neighbourhood. Many roofs run out from the left bank. About 30 miles on the way brought us to a sharp bend in the river, called Tung-lo-wan, with a succession of strong rapids. Just beyond that we stopped for the day at the town of Han-wang-ching, although it was yet early; our skipper fearing to risk the next rapid, called Kwan-tsze-tan, till the water went down somewhat. A boat which passed us in the morning on the way down was anchored at the same place, having run against a rock, broken the rudder, and sprung a large leak. Having several hours to spare, I visited a fortress, the Teen-paou-chae, on the top of a hill there, something over 400 feet high. It was built a few years back by the inhabitants, as a refuge against the rebels. The place is admirably adapted for defence, the ascent being steep on all sides; and, with a well-trained force to defend it, no enemy could ever approach. There were six two-story houses in tolerably good condition, in which a great number of natives could be stowed, but not a person was in occupation. Another fortress stood on the top of a high hill on the opposite side of the river. Tea and silk are produced in the neighbourhood, and form articles of commerce.

As the water had subsided a great deal during the night, we started soon after sunrise on the 23rd. Within a mile of our anchorage, two small hill islands stood in the river, forming three narrow channels, of which we floated down the left-hand one. A little way beyond we passed a number of coal-pits on the left bank. Some five miles lower, the Seaou-sung River from the north enters the Han, forming the boundary between the districts of Han-yin and Tsze-yang. There is a good deal of firewood in this part of the country, which the natives make up into faggots and pile up along the banks for sale. Our skipper filled every available corner with a cargo of it as a commercial speculation, some of the men also investing their money in a similar enterprise. Thirty-four miles beyond the last-named stream, the Choo-ho, a current of bright green water, enters the Han on the right, contrasting strongly in colour with the very muddy water of the latter as it becomes absorbed in it. This river rises, under the name of the Pih-keang, on the north of Hwang-tun Hill, in the east of the district of Tae-ping in Sze-chuen province, and enters Shen-se on the east of Maou-pa Pass; it then joins the Choo-ho, another branch flowing in from the south of the district of Tsze-yang; and after receiving several tributaries in its north-easterly course, it discharges its waters under the latter

name, but is sometimes called also the Jin-ho. Ten miles up this river is a quarry, famous for the production of ink-pallets. Nearly opposite, but a little lower, stands the city of Tsze-yang, a small place built on the summit of a low hill, with a scattered suburb spreading down nearly to the water's edge. Slates are produced in abundance in this neighbourhood, and most of the houses are roofed with them; not cut to any regular shape, but heaped on just as chance seems to have decided the form. There we took a pilot on board, to guide us through a rapid about a mile below the city. The waves were like a little sea, and far exceeded anything of the kind we had previously come to on the Han. Ten miles below the city is a temple perched high up on the face of the cliff, named the Me-ke-seen-tung (Fairy Grotto of the Rice-stream); the tradition connected with which is, that in former times a small aperture in the rock was wont to pour out daily a quantity of rice, just sufficient for the number of people depending on it; it might be one, or it might be a hundred, the supply was always equal to the demand. A crevice was pointed out to us at the back of the principal idol, as the mouth of the mysterious spout, but on examining it, we found there was actually no opening deeper than two or three inches. A similar legend attaches to several spots in China. Nearly opposite, on the right bank, is the long village of Joo-ho, named after a river that rises in the vicinity of the Chwang-ho Pass to the south-west, and enters the Han there. We again got a pilot of the place to take us through the Joo-wau-tan, a rapid equal to the one near the city; and also the Loo-tsze-tan, another great rapid, a mile or so lower down. Just below the village of Ta-taou-ho, coal was being wrought in the face of the cliff; and a mile or two farther on we passed the Sin-tan, a rapid scarcely inferior to any we had yet encountered. Five or six miles beyond, there were numerous coal-pits on the right bank. Ten miles farther we stopped for the night, against the village of Lew-shwuy-teen on the left.

A mile or two after leaving our anchorage next morning, we found them working coal in the cliff. About eight miles lower we passed the Lan-ho, a stream which rises at the Hwa-lung Hill, on the south-eastern boundary of the district, and receives two or three small affluents before it disappears in the Han. Somewhat lower the Heang-ho, a river rising in the south-west of Ping-le district, enters on the right. The Han retains much the same character, a tortuous channel of six or eight hundred yards wide between high hills for about 30 miles farther, when the prospect begins to open out, and a succession of low hills gradually decline to a plain of some tens of miles' extent. The Yue-ho, another considerable stream, which rises from two sources in the north-west of the district of Han-yin, passes the district city, and receiving a number of tributaries, large and small, enters the Han after a south-easterly course of nearly 150 miles. A few miles further east we reached the prefectural city of Hing-gan, the appearance of which does not strike one as first-class. As with many other Chinese cities, the business is mainly confined to a large suburb skirting the river. A good deal of silk manufacture is apparently carried on, and there is a considerable assemblage of boats. From that point there is a highway by land to Se-gan, the capital of Shen-se. We were detained half a day on account of some informality on the part of the skipper in arranging with the customs. Some miles beyond the city we passed the mouth of the Hwang-yang-ho, a river rising from two sources on the south-east boundary of the district of Ping-le, which passes the district city on the west, and the prefectural city on the east, in its northward course. The hills on each side resume their abrupt and lofty character, and the channel becomes more contracted. After passing two notable rapids the night closed upon us, and we continued our journey for several miles by moonlight, anchoring for the night at the village of Leu-ho-poo. The Leu-ho, a river rising among the

hills south of the Tsih-le Pass on the border of Hoo-pih province, after receiving four tributaries in its northward course, enters the Han on the west of the village.

Early on the 25th we reached another rapid, where it was necessary to get a native to guide us through; and, 10 miles from our anchorage, arrived at the district city of Seun-yang. This is built on the top of a low mound, and appears to be but sparsely inhabited. On the east side of the city is the Seun-ho, which rises on the south-west of the Tae-yih Hill, in the north-east of the district of Hoo, and, flowing in a south-easterly direction, receives several affluents before uniting with the Chin-gan River. The latter, bringing down the accumulated contents of the various streams in that district, increases very materially the volume of the Seun-ho, which flows into the Han, after a course of 170 miles. The only other affluent of the Han in Shen-se, comparable with this in magnitude, is the Hih-lung-keang in the prefecture of Han-chung. Twenty miles lower down, the town of Shuh-ho-kwan on the left, stands on both sides of the Kow-yuen-shwuy, which flows in from the north. There is a road from this place direct to Se-gan. Seven miles more brought us to the mouth of the Ta-tsung-ke on the left, a small stream in a ravine, dividing the provinces of Shen-se and Hoo-pih on the north side of the Han. A considerable distance beyond, is the Lang-shwuy-ho on the right bank, flowing in from the south-west. A good way further on, the town of Kea-ho-kwan stands on the east side of the Kea-ho, a river also called the Keih-shwuy-ho, rising in the north-west of the district of Yuen-se, which receives two tributaries, and, after a flow of 80 miles, discharges on the left bank, east of the Kin-lan Hill. On the summit of this hill is a temple of great celebrity, dedicated to Henen-teen-shang-te. Seven miles beyond, we passed the Pih-ho on the right, a river flowing in from the south-west, also called the Ta-pih-shwuy-ho. To the east of this stands the district city of Pih-ho, curiously built over the summit of several hills, in a very irregular form. The buildings inside the wall being few and scattered, a good deal of the ground is cultivated. The principal part of the business, which does not seem great, is conducted in a long suburb running parallel with the river. On the east of the city, the Seaou-pih-shih-shwuy, a small river which rises to the south-west, flows down a rocky ravine, and forms the boundary between Shen-she and Hoo-pih, on the south side of the Han. The length of the Han, from the source to this point, is about 440 miles. Just beyond this we anchored for the night.

At 12 miles on the way next morning we passed the San-chung-ho on the right, a river flowing in from the south-east, with a village of the same name at the mouth. Some 30 miles eastward is the Hwang-leen-shwuy on the left, which rises from two sources near the northern boundary of the district. The streams unite on the south of the city of Yuen-se, from which the river flows south into the Han, making a course of nearly 60 miles in its greatest length. At no great distance beyond this, the Keuh-yuen-ho, or Keuh-ho, which also rises in the north of the district, not far from the Taou-ho, enters the Han on the left. The country bordering on the river now gets more open, the hills much lower and all cultivated, when we reach the mouth of the Tow-ho, a large river flowing in from the south. The source of this is near the point of junction of the three provinces of Tze-chuen, Shen-se, and Hoo-pih. After flowing west for 100 miles, it receives a large affluent from the north-west, which passes the district city of Chih-ke; the united stream, after receiving another principal tributary from the south, passes the district city of Chih-shan on the east, and flows north into the Han, making in its greatest length a course of nearly 250 miles. The hills, which are of sandstone and conglomerate in nearly horizontal strata, continued to decrease in height till we reached

the prefectural city of Yuen-yang, where we anchored for the day, against the south-western suburb. A small stream from the south-west enters there on the right. A hill on the right bank, directly facing the city, is called the *T'ëën-ma-shan*, or "Hill of Pegasus," the tradition concerning which is, that in ancient times, when it split open, the cliff exhibited the three characters 天馬王, *T'ëën-ma-wang*, "The King of the Celestial Horse." Adjoining this, on a smaller hill, is a tall slender pagoda without galleries, named the *Kih-sing-tă*, "Polar-star Pagoda." There is a popular tradition concerning that also, that it was built by a former prefect, who suspected the fidelity of some of his wives, and that when the structure was raised in view of the official residence, such was the effect of the *fung-shuey* or "geomantic" influence, the grievance ceased. It was built in the year A.D. 1755. Just facing the pagoda, the *Wan-chang-tă*, or Sanctum dedicated to Wan-chang, forms a conspicuous object inside the south-east corner of the city. There is a Keang-se guild in the city, and also a joint guild of the Shan-se and Shen-se traders, called the Shan-shen-meaou.

From this point to Hankow, the descent of the river occupied us nine days more, and we arrived in the afternoon of September 4th.

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4. *Report on a Journey to the Upper Waters of the Niger from Sierra Leone.* By W. Winwood Reade, Esq.

(Communicated by the Colonial Office.)

"Sierra Leone, 21st December, 1869.

"Sir,

"Although I have already made a report to your Excellency upon the details and results of my first journey into the interior from this Colony, it will be convenient for me to speak of it again as briefly as possible, since it is difficult to separate the two journeys. In fact, I consider that from January 20th to November 5th, I have been engaged in one and the same expedition. The whole of that period of time, with the exception of a fortnight in June, was passed by me in the interior. Under the government of Sir Charles Macarthy, Major Laing travelled to Falaba, about 200 miles north-east of Sierra Leone. He was not allowed to pass that town, and, after remaining some time there, returned to the Colony. Nothing resulted from that journey, and since then half a century passed, and not a single traveller attempted to open up the country directly interior of this settlement. In my journey to Falaba, commenced in January, 1869, I took a route different from that of Laing. He went from Mahello, I from Port Loko, and my route led me through the country of the Limboos, a people much dreaded by Native travellers, and through whom I had great trouble in passing. On my arrival at Falaba, I found that I was within three days' journey of the Niger; but the King, following the example of his father, would not permit 'his white man' to pass. I was detained at Falaba three months.

"But though my journey had failed in a geographical sense, I saw that it could be turned to account for the benefit of the Colony. My journey through the Fimmanee country had proved to me that the stipend-system was an admirable instrument for the governing of Africa outside the British jurisdiction, and I was convinced that it might be advantageously extended. Accordingly I brought down with me Deputies from the Kings of Falaba and Limbo. The Falaba envoys, delighted with the presents which they received from your Excellency, and even more delighted with the honours which had

been paid them, assured me (and yourself as well), that I should be allowed to pass Falaba, should I visit it again.

"Although I was not in strong health, and the rainy season had commenced, I at once determined to go back with them. The gratitude of the African is very evanescent. I believed that the King would allow me to pass Falaba, if I returned with his messenger; but that if I waited till the dry season, the presents would be spent, half forgotten, and that fresh difficulties would arise. The Falaba messengers afterwards congratulated me on my prudence in that step, which was based on my knowledge of the private character of the King. He received the presents (which he had not expected) with great gladness, also the account of the manner in which his envoys had been received by you. He said that now 'the road belonged to you,' and that accordingly I was free to pass, which I did after remaining three days. A journey of 50 miles brought me to the Niger. At this point it is only 100 yards broad. It has been my fortune to see the Upper Niger nearer to its source and nearer to the coast than any other European. Crossing the Niger, I entered the Sangara country. At the first town, Farabana, I ascertained that the source of the river was inaccessible, owing to a war. I determined, therefore, to make an attempt to reach Bouré, and also to ascertain at what point the Niger became navigable for canoes. I succeeded in both these efforts; which of the two journeys would be preferred by geographers—Bouré or the Niger's source—is difficult to say. Each has an interest and value of its own, but there can be no doubt which of the two journeys would be the more serviceable to this Colony. A journey to the Niger's source would be a geographical feat, but it could have no practical result. The river, above the point where I struck it, would certainly be useless for purposes of navigation, and passes through the country of the Koranko, mere savages, who have nothing to sell but slaves, and with whom we can have no communication. But in travelling through the Sangara country to Bouré, in going north-east from Farabana, instead of south, I passed through the country of that enterprising people, who bring down hides and gold to this Colony.

"I visited our customers; in fact, Sangara is the land of hides, Bouré, of gold. At the end of the Sangara country I met the Niger again. It had received tributaries, and was now a noble river, offering no obstacle to navigation between the point where I struck it the second time, and those rapids which check the navigation of the Lower Niger. I crossed the Niger again to this side, and travelled through a wilderness about 45 miles broad to Fouré—the gold country celebrated throughout Central Africa—never before visited by a white man.

"Your Excellency will understand with what regret I turned my back on the Niger to return. But I had been able to carry only 50*l.* worth of goods; cloth and tobacco is the money of the country, and everything has to be carried on men's heads. I had been compelled to 'pay the road' from the beginning to the end of my journey, according to the custom of the country, for black travellers have to pay as well as white. It is, indeed, remarkable that I was able to go so far with such small means. It was only by exercising the most rigid economy that I was able to do so.

"However, at Bouré, I found that I had only enough to pay the expenses of my return journey, and arrived at Sierra Leone with very little cloth in my possession. I consider it needless to trouble you with details of my journey, which will be presented to the public in due course. I had to suffer the usual hardships and anxieties (harder still) to which African travellers are always exposed. Want of animal food, difficulties of passing certain towns, some of my men deserting, others falling sick, and so on. But I shall at once proceed to the possible results of my journey.

1. "It is now in your Excellency's power to annex (to all intents and purposes) the country lying between Port Loko and the Niger at Farabana. The payment of 200*l.* a year to various chieftains on the road will make you their chief. I need not dwell on the advantages of the stipend-system; nobody knows better than yourself that Africa is to be conquered by money, not by arms. I formerly recommended that the Kings of Falaba and Limba above should be stipended, and that they should sub-stipend the smaller chiefs. But in my second journey I have learnt that they cannot be trusted to do this. I am now convinced that every chief who has the power to 'cut the road,' or plunder travellers, must have a stipend from Sierra Leone itself. Under this new plan the stipends of the great chiefs would, of course, be reduced. The object of thus possessing the road to the Niger is, of course, to attract the hide and gold strangers who live beyond the Niger. We have a rival in the Melacurie; but by stipending the King of Falaba, he would use his great power and influence to make the Sangarra take what will doubtless be called the Governor's road, and by stipending the troublesome Limbas, the Sangarra would no longer be subjected to dangers of robbery, and even murder in that country. I consider, therefore, as the first result of my journey, that it will enable your Excellency to take steps which will produce within the next few years a very great increase of the hide and gold imports to this Colony.

"2. In Africa precedent is all powerful, where a white man has once been he can always be followed by a white man, unless a decidedly bad impression has been made. There is now no difficulty in reaching a navigable point on the Niger. An expedition, furnished with boats properly constructed, could, after a short and easy land journey (it was not easy to me, but it will be to my successors), go by water to a point on the Niger close to that which is reached by the annual expedition from the Bight of Benin. Nature offers no obstacles to such a voyage, but some obstacles would doubtless be offered by the natives.

"3. The road to the hide and gold country is now open and safe. Sierra Leone traders might carry goods to Sangara and Bouré with advantage. This was so apparent to my men that several of them determined to make the speculation in the next dry season.

Briefly to sum up what I have done,—

"1. I have ascertained who are the chiefs whom it would be advisable to stipend, and brought down (in your absence) deputies from almost all of them. Details relating to the stipendees will be communicated by me whenever your Excellency may direct.

"2. I have discovered the Niger at the distance of only 250 miles from Sierra Leone.

"3. I have ascertained the point where the Niger becomes navigable for large canoes, about 350 miles from Sierra Leone.

"4. I passed through the whole extent of the Sangara country, the people of which come in vast numbers to this Colony. I explained to the chiefs of every town that I passed, the exertions which you were making to clear the road, and stimulated them to increased traffic.

"5. Finally, I reached Bouré, a journey of 450 miles.

"6. I have to report that, in the countries visited by me, cotton is largely cultivated for home use.

"7. I believe that any messenger sent by your Excellency would be able to go not only as far as I have been, without hindrance, but much further. I brought down an envoy from Bouré, and two also from two powerful chiefs resident on the Niger, near Bouré. They received presents from the Administrator-in-Chief, and would, I am sure, assist any government messenger.

"I trust, Sir, that the efforts which I have made in the service of this

Colony will obtain the approval of your Excellency. I can, at least, assure you that I have from first to last striven conscientiously to do my best.

"When you trusted me with the powers of a representative of your Government, I determined that you should never have occasion to regret that you had made that experiment; and I hope that hereafter my journey may be reckoned among the many benefits which your administration has conferred on Sierra Leone.

"I have, &c.,

(Signed) "W. WINWOOD READE.

"*Sir A. Kennedy, C.B.*"

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Issued August 15th, 1870.]

SESSION 1869-70.

Ninth Meeting, March 28th, 1870.

Sir RODERICK I. MURCHISON, Bart., K.C.B., President, in the Chair.

Elections.—*John C. Ardagh, Esq.*, Lieut. R.E.; *Somerset Beaumont, Esq.*, M.P.; *Charles Clark, Esq.*; *John Douglas, Esq.*; *Squire Thornton Stratford, Esq.*, Lieut. Royal Naval Reserve; *Captain Charles E. Luard*, R.E.; *William Martendale, Esq.*; *John Moore, Esq.*; *William Johnstone Newall, Esq.*; *Major-General the Hon. Charles Dawson Plunkett*; *William O. Stoton, Esq.*; *Lieut.-Colonel D. W. Tupper*; *Thomas Wall Stephens, Esq.*

Accessions to the Library from the 14th to 28th March.—'Report on the Trade of the Upper Yang-tsze.' By A. Michie, Esq. Shangai, 1869. 'Géographie du Perou.' (Traduction Française.) By Don M. F. P. Paz Soldan. Paris, 1863. By Purchase. 'Le Chili: son Agriculture.' By B. V. Mackenna. Paris, 1855. By Purchase. 'Land und Volk in Afrika.' By Gerhard Rohlfs. Bremen, 1870. 'Visit to Lord Howe Island.' By Ed. S. Hill. Sydney, 1869. Donor, the President. 'Guide du Voyageur en Corse.' Ajaccio, 1868. Donor, S. M. Drach, Esq. 'Notes médicales du Mekong et de Cochinchine.' Par C. Thorel. 1870. 'Temperature de la Mer, entre l'Islande, l'Ecosse et la Norvège.' Par H. Mohn. Christiania 1870. 'La Terre: Description des Phénomènes de la Vie du Globe.' Par Elisé Reclus. 2nd edit. Paris, 1870. Donor, the author. 'A Poor Man's Photography at the Great Pyramid in the year 1865.' By C. P. Smyth. Donor, the author. 'Botany and Agriculture of Malta and Sicily.' By H. Cleghorn. Edinburgh,

1870. 'L'Année géographique.' Par V. de Saint-Martin. Paris, 1870. 'Neues aus der Geographie, Kartographie und Statistik Europas und seiner Kolonien.' Berlin, 1870.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF MARCH 14TH.—A Map of Virginia, U. S. By J. T. Lloyd; being a copy of the one used by General M'Clellan during the Civil War. Presented by G. T. Archer, Esq., F.R.G.S. South Polar Chart, from Steiler's 'Hand Atlas;' showing the tracks of Explorers and Icebergs. By Dr. A. Petermann. Upper part of the Yang-tse-Kiang River; from Yoh-chau-fu to Kwei-chau-fu. Admiralty Chart. Views of the above portion of the River. Presented by Consul Swinhoe. Admiralty Charts, 9 in number. Presented by the Hydrographic Office, through Captain G. H. Richards.

The following Paper was read:—

On FORREST's *Expedition into the Interior of Western Australia*, GOYDER's *Survey of the Neighbourhood of Port Darwin, and on the recent Progress of Australian Discovery.* By Sir CHARLES NICHOLSON, Bart.

THE determination of the actual fate of Dr. Leichhardt, the most enterprising and distinguished of all Australian travellers, has for the last twenty years been a subject of intense interest amongst all the civilized communities of Australia. A feeling of anxiety, similar to that which for so long a period agitated the minds of men in Europe and America, as to the ultimate fate of Franklin and his intrepid followers, attaches itself to the history of Leichhardt's last expedition. And as various rumours of the last explorer have from time to time reached the settled portions of the territory, expeditions have been fitted out, and renewed searches made in the supposed track of the lost traveller and his companions, without, however, yielding any definite result, beyond the tracing of their footsteps to a point somewhere to the south-west of the head of the Gulf of Carpentaria. Beyond this point all reliable indications of Leichhardt's further progress disappear; and it now seems almost vain to hope that the obscurity with which his fate, and that of his party, is involved will ever be cleared away. There are, however, still some few persons—who hope against what would seem all human probability—that some of Leichhardt's party may be still surviving in the interior wilds of the country; and for the rescue of these, and, at all events, for the procuring more definite information as to the course of the expedition beyond the point to which it is believed that it has been already traced, are anxious to organize fresh parties for exploration. Amongst the most generous

and enthusiastic supporters of this forlorn hope, the name of Dr. Mueller may be mentioned. He has never desisted, for years past, to urge upon the colonists, and all interested in geographical science, renewed efforts for the search after his illustrious countryman, or for such remains of him and his party as he believes may still be discoverable.

One of the last attempts made, with the view of gaining intelligence on a subject invested with such a melancholy interest, was undertaken in Western Australia, under the auspices of the Local Government. A report had reached Perth that the bones of two white men and their Native companions, who had been killed about twenty years ago, were to be found at a spot called Koolanobbing, which is in lat. about 30° 53′ s., and long. 119° 14′ e. A small expedition was in consequence dispatched, under the leadership of Mr. John Forrest, for the purpose of ascertaining the real facts connected with this report. Mr. George Monger was second in command, and the party comprised two other Europeans, and two aboriginal Natives, Tommy Windich and Jimmy Mungaro. The last mentioned Native was the one who gave Mr. Monger the information respecting the murder of the white men to the eastward. The party, having been fully equipped for its undertaking, reached Newcastle on the 17th, and started on the 19th of April last, with a three-horse cart and teamster, and thirteen horses, making a total of sixteen horses.

On the 21st two small lakes—the Walyamurra and Koombekine—were passed; the water in the latter was bad from opossums being discovered in it, and there was little or no grass in the neighbourhood. For the next five days the course extended through undulating sandy plains, covered with scrub. On the 27th the party reached the Waddouring springs in lat. 31° 13″ s., and long. 118° e. (a point which had been reached by Gregory in his journey of 1846), and thence proceeded nearly due north through a country of the most uninviting kind, consisting of low granite hills, gum-forests and thickets of spear-wood:, these being alternated by dense grove of acacia and cypress. Mount Churchman, or Geelabbing, was reached on the 4th of May; the same uninviting character of country still continued, through the most of the route hitherto followed, water being procurable only in the most scanty supplies, and by deepening the Native wells. The neighbourhood of Mount Churchman (the Singleton of Gregory), an immense bare granite hill, furnished, however, a supply of grass and water. On the evening of the 5th of May, a party of nine Natives, friends of Jimmy, joined the camp. They stated that, a long time ago, a party of white men

and horses died at a place called Bouincabbajillimar, also that a gun and a number of other articles were there, and at the same time they volunteered to accompany Mr. Forrest and his party to the spot.

May 6.—Leaving Mount Churchman and crossing one of the arms of Lake Moore, the direction of the course followed was north for about 11 miles, to a spot called Currone. Here the party bivouacked, and a suspicion began to be entertained that the information communicated by the Natives related to nine horses that had died from poison at Poison Rock; for the Natives now state that the bones of which they spoke belonged to horses, and were not those of men. This report was subsequently confirmed by a fresh party of Aborigines, who were met with on the 12th of May, and who had a grand corroboree in honour of the expedition. Being satisfied that the Natives alluded to the remains of Mr. Austin's horses, Mr. Forrest resolved to steer to the eastward, to a point called by the Native guide Noondie, where he asserted he had heard the remains of the white men were.

On the 18th of May a branch of a dry salt-lake was crossed, and on the 19th an attempt was made to cross the principal bed of the lake itself (which had been hitherto skirted along its northern shore), making for a spot which was supposed to be on the opposite or southern bank, but which, on being reached, was found to be an island. Crossing from hence to a point south-east, the party camped on a second island, where there was a little food, but no water.

Having, after great difficulty, in consequence of the depth of mud along its shores, succeeded in getting the horses, with their baggage, again on the north side of the Lake Barlee, Mr. Forrest, seeing a Native fire several miles to the southward, resolved upon sending Tommy and Jimmy the following day, in order that they might make inquiry respecting the reported death of the white men to the eastward. They returned on the 22nd, having seen some Natives after dark, but were unable to get near them.

On the 25th, steering for Yeadie and Bulger,

"for 5 miles, came to some water in granite rocks, which we gave our thirsty horses. Leaving the party to follow, I went with Jimmy in advance to look for water, which we found in a rough stream-bed, and brought the party to it. This afternoon went with Jimmy to the summit of Yeadie, and took a round of angles. The local attraction was so great on the hill that the prismatic compass was useless; luckily, I had my pocket sextant with me, by which I obtained the included angles. From the summit of Yeadie the view was very extensive. The great lake, which we had already followed for 40 miles, ran as far as the eye could reach to the east and south, studded with numerous islands. Low ranges and hills in every direction. This immense lake I named Lake Barlee, after the Honourable the Colonial Secretary. By

meridian altitudes of Mars and Regulus, camp was in south latitude 28° 5′ 50″, and in longitude about 119° 39′ E., Yeadic bearing S. 172° E. mag., distant about 2 miles."

On May 29th, they reached Noondie, Mt. Alexander, and on the 31st they overtook a party of Natives. On the 7th of June they reached the extreme northern part of their journey, in latitude 28° 36′. On the 10th started with Mr. Monger; on the 16th sighted a large lake.

On the 18th of June, Mr. Forrest reports that, having made an exhaustive search for Leichhardt's remains in the spots indicated—

"I determined to make the most of the little time at my disposal, and carry out my instructions, which were to attempt to proceed as far eastward as possible. Accordingly, after collecting the horses, steered about E.N.E. for 9 miles to a low quartz range, over tolerably grassy country, not very dense. From this range I saw some bare granite rocks, bearing about S. 120° E. mag., for which we steered, and luckily, after travelling 6 miles over a plain, which in severe winters must be almost all under water, found a fine pool of water in a clay-pan and bivouacked. Rained a little during the night."

On the 23rd—

"Started this morning, in company with Tommy Windich, to explore the country to the eastward for water, &c. After travelling 3 miles towards Mount Leonora, saw a Natives' fire, bearing north-east about 3 miles, to which we proceeded, and surprised a middle-aged Native at a fire. Upon seeing us, he ran off shouting, &c., and the remainder of his companions, who were at a little distance, decamped. The horse I was riding ('Turpin,' an old police-horse from Northam) appeared to well understand running down a Native, and between us we soon overtook our black friend and brought him to bay. We could not make him understand anything we said, but after looking at us a moment, and seeing no chance of escape, he dropped his two dowaks and wooden dish, and climbed up a small tree about 12 feet high. After securing his dowak, I tried every means to tempt him to come down. I fired my revolver twice, and shewed him the effect it had on a tree, and it also had the effect of frightening all the Natives who were about, who, no doubt, made off at a great rate. I began to climb up after him, but he pelted me with sticks, and was more like a wild beast than a man. After discovering we did not like to be hit, he became bolder and threw more sticks at us, and one hitting Tommy, he was nearly shooting him, when I called on him to desist. I then offered him a piece of damper, shewing him it was good by eating some myself and giving some to Tommy; but he would not look at it, and when I threw it close to him, he dashed it from him, like as if it were poison. The only means of getting him down from the tree was force, and, after considering a moment, I decided to leave him where he was, and accordingly laid down his dowaks and dish and bade him farewell in as kindly a manner as possible. Continuing our course, passing Mount Leonora, we steered S. 81° 15′ E. mag., to a table-hill, which I ascended and took a round of angles. This hill I named Mount Malcolm, after my friend and companion Mr. M. Hamersley. Saw a remarkable peak, bearing S. 65° E., mag., distant about 20 miles, towards which we proceeded, and at 6 miles came on a small gully, in which we found a little water, and bivouacked."

On the 25th, he continues—

"Saddled up at dawn, and proceeded to the range, which bore N. 93° 30' E., mag., about 5 miles distant, on reaching which I ascended the highest peak, which I named Mount Margaret, and took a round of angles and bearings. From the summit of Mount Margaret the view was very extensive. A large dry salt-lake was, as far as the eye could reach, to the southward, while to the east and north-east there were low trap-ranges, lightly grassed. A high table-hill bore N. 73° E., mag. Being now about 60 miles from camp, and not having had any water since yesterday morning, I decided to return, and steering about west for 8 miles, we struck a brook, trending south-east, in which we found a small quantity of water in a clay-pan. After resting an hour, in order to make a damper and give our horses a little of the feed which grew very sparingly on the banks of the brook, we continued our journey towards camp. Passing Mount Flora, we camped about 8 miles farther towards camp, on a small patch of feed, without water, about a mile north of our outward track."

On the 1st July the party reached the extreme eastern point of their journey, lat. 28° 41' S., long. 122° 37', and retraced their steps to the north side of Lake Barlee, which they reached on the 13th of July. From hence their course was westward, in nearly the same parallel, to a point Bunnaroo, again intersecting Gregory's route. From this the course followed was southerly, and Mount Singleton, or Ninghan, was reached on the 23rd of July. A further détour to the westward led through the bed of Lake Monger. Here, on the 26th, they met

"two natives, whom we had seen on our outward track at the Warne corroboree, who were, of course, friendly, and slept at our camp. They had a great many dulgites and opossums, which they carried in a net bag, made out of the inner bark of the Ordnance-tree, which makes a splendid strong cord. They informed us that a Native had come from the eastward, with intelligence relating to the encounter we had with the large tribe on May 31st, and adding that we had been all killed, and that all the Natives in this vicinity cried very much on hearing the news. This is another specimen of the narrations of Natives, with whom a tale never loses anything by being carried."

Mr. Forrest concludes his report by the following observations:—

"I now beg to make a few remarks with reference to the main object of the Expedition, viz., the discovery of the remains of the late Dr. Leichhardt and party. In the first place, Mr. Frederick Roe was informed by the Native Weilbarrin, that two white men and their Native companion had been killed by the Aborigines, thirteen days' journey to the northward, when he was at a spot called Koolanobbing, which is in south latitude about 30° 53', and longitude about 119° 14' E.

"Mr. Austin lost eleven horses at Poison Rocks (nine died, and two were left nearly dead), which is in latitude 28° 43' 23" S., and longitude about 118° 38' E., or about 150 miles from Koolanobbing, and in the direction pointed to by the Natives. I, therefore, imagine it to be very probable that the whole story originated from the horses lost by Mr. Austin at Poison Rock, as I am convinced the Natives will say anything they imagine will please you. Again, the account given to us at Mount Churchman, on May 5th, appeared very straightforward and truthful, and was very similar to that related to

Mr. Roe; but, on questioning them for a few days, they at last stated there were neither men nor guns, but only horses' remains, and pointed towards Poison Rock. Again, the Native who gave all the information to Mr. Monger was one of our party. His tale, as related by Mr. Monger, appeared very straightforward and truthful, viz., that white men had been killed by the Natives twenty years ago; that he had seen the spot, which was at a spring near a large lake, so large that it looked like the sea as seen from Rottnest, eleven days' journey from Ninghan, or Mount Singleton, in a fine country; the white men were rushed upon while making a damper, and clubbed and speared; he had often seen an axe which formed part of the plunder. All this appears very feasible and truthful in print; but the question is, of what value did I find it? Upon telling Jimmy what Mr. Monger stated he told him, he said he never told him that he had seen these things himself, but that he had heard it from a Native who had seen them: thus contradicting the whole he had formerly stated to Mr. Monger. Moreover, the *fine* country he described we never saw, as what a Native calls good country is any place where they can get a drink of water and a wurrong; and if there is an acre of grassy land, they describe it as very extensive grass country. This I have found the case time after time. As a specimen of the untruthfulness of these Natives, I may quote that my Native Jemmy, who was a first-rate fellow in every other respect, stated to Mr. Monger and myself at York, that there was a large river, similar, he said, to the Avon at York, to the eastward, knowing at the time that we would find out he was telling a falsehood. He even told Mr. George Monger, before leaving Newcastle, to buy hooks, in order to catch the fish that were in the river; and concluded by stating we would have a great difficulty in crossing it, as it ran a great distance north and south. Almost every evening I questioned and cross-questioned him respecting this river; still he adhered to what he first stated. You may imagine how disappointed we all were, on reaching the spot, to find it was a small brook running into a salt marsh, with water in winter, but dry in summer.

"With reference to the country travelled over, I am of opinion that it is worthless as a pastoral or agricultural district; and as to minerals, I am not sufficiently conversant with the science to offer an opinion, save that I should think it was quite worth while sending a geologist to examine it."

Port Darwin.—The whole of the immense district in Australia comprised between the 128th and 138th degrees of east longitude, and north of the 26th degree of south latitude, having been annexed to the Government of South Australia by an Act of the Imperial Legislature, successive attempts have from time to time been made to form a European settlement at some suitable point on the North Coast. In consequence of the successful journey accomplished by Macdougall Stuart in his second expedition in 1862, it was believed by many persons interested in South Australia that a practicable route could be opened up between the northern and southern shores of Australia, and connecting the latter with the Indian Ocean. This idea was so eagerly seized and acted upon that, without any sufficient preliminary survey and selection of a suitable site, the Government of South Australia at once proceeded to lay out and sell considerable areas of land in the newly acquired territory. It was soon found that great difficulties existed in giving

effect to intentions at first so sanguinely entertained. Communications between Adelaide and North Australia could only be effected by a long or circuitous sea-voyage; for transit overland, although shown to be possible, was, owing to the character of the intervening desert, virtually not practicable as an ordinary line of communication. The locality, at first deemed most suitable for the formation of a settlement, had to be abandoned, and some fresh site looked for. As a large sum of money had been already received by the Colonial Government from intending purchasers of land, of which it found itself unable to give possession, a considerable amount of loss and disappointment, and, I believe, angry reclamation, ensued. Without adverting any further to these topics, I may briefly add that the Government of South Australia, anxious to redeem its pledges, has taken steps to ascertain and fix upon the most desirable locality for the intended settlement on the Northern Coast. A well equipped surveying party, under the able direction of Mr. Goyder, Surveyor-General of South Australia, has, during the past year, examined and reported upon a considerable extent of country at Port Darwin which, it is believed, possesses capabilities for becoming the seat of a flourishing township and settlement. I shall now proceed to read a few extracts from Mr. Goyder's last official report, dated 23rd November last:—

"We have here a splendid harbour, suitable to vessels of the largest tonnage—deep water and good holding-ground. At a trifling cost, jetties or wharfs might be constructed, and the place is healthy; and the sites of the township, here and elsewhere, the most healthy the country affords. We have also obtained good roads thence into the interior, and lands varying in character from light sandy loam to rich black and chocolate-coloured soils, with water and grasses in abundance—the quality of the pasture improving towards the south, south-west, and south-east. I believe, from the experience of others and what I have seen, that this harbour is the best in the locality; and with its high lands and deep waters close to the points of landing, estuaries radiating towards the interior, and navigable to lands suitable to the growth of any product adapted to the climate, with first-rate pasturage for large stock—I think it is too hot for sheep—and supply of water, though in the dry season, except in watercourses or water-holes, this will have to be obtained by sinking below the surface, most suited for the purpose of commerce, and likely to lead to the satisfactory settlement of the country. I look, therefore, upon the object of the expedition as gained, and consider that the quality of the land under survey, the timber, vegetation, and conveniences for traffic equal, if not surpass, the most sanguine expectation of the land-order holders and those interested in the development of the country. It is to be borne in mind, however, that so far our experience only extends to the rainy season and the early portion of the dry, by the end of which grass that is now green will be dry, and the earth in many places look parched and dusty. But this is common to all countries in this latitude; indeed, the same may be said of the greater portion of South Australia. My first impressions in its favour, as detailed in my previous report, are only confirmed by more extended travel; and I trust that but a short time will elapse before it is occupied. Apart

from the suitability of much of the soil for the growth of cotton, sugar, rice, &c., it is invaluable for breeding large stock, and horses or cattle could readily be shipped and conveyed to India. It is true the heat is great, and the climate, for at least six months in the year, oppressive, and for Europeans it is as bad as some portions of India; and the same amount of work cannot be done as in South Australia without great determination and exertion. But again, our experience is that of men new to the locality, and much may be done by acclimatization; but labour can be readily obtained from the adjacent islands, and at a cost so trifling compared with that of European labour, that the latter would only be resorted to where inspection or direction became necessary."

"The survey extends from Fort Point, in a south and south-westerly direction, as far as Fog Bay, Point Blaze, north of Anson's Bay; southerly, a distance of 58 miles to the southern and eastern sources of the River Finniss; and easterly, to the swampy lands lying east of the Adelaide River. I did not survey any of the land on the Adelaide Plains, because most of them, as far south as Fred's Pass, are covered with water for eight months of the year; and, for a considerable distance to the south of the pass, the country adjacent to the river is impracticable for traffic most of the year, large paper-bark swamps existing between the west bank of the river and the higher lands flanking the plain. From latitude 13° s., however, east-south, and south-west of Mount Charles, there is over a million of acres of land of fair average quality, some of it exceedingly rich, other portions equally poor and sandy, but most of it suited to the growth of tropical or semi-tropical products; the whole well grassed and watered, and admirably adapted for depasturing cattle or horse-stock. To the south of the Finniss, and extending in the direction of the rivers Daly and Victoria, the land, so far as our operations and examination enabled us to judge, continued to improve in character and quality, and running streams were more abundant; but my means, and the object of my journey, did not permit me an opportunity of examining its extent or detail, the horses being nearly all required by the field-parties, and my presence being necessary at Fort Point to ensure the proper preparation of the records of the survey, and to push on necessary works at that place prior to the completion of the duties required to be performed by the field-parties; as it is, half my time here has been occupied examining the country in advance of the surveys, and in visiting the several parties."

"The country in the neighbourhood of Fort Point consists principally of table-land of from 60 to 150 feet above the sea-level, falling thence gently towards the sea, except upon portions of the coast between Fort Point and Point Emery, where it forms into cliffs of soil over a level bedding of indurated marl—with red and yellow stains from iron—over beds of slate and micaceous sandstone, very unctuous to the touch, and also containing a good deal of iron; these latter strata are nearly on edge or perpendicular, and run in a northerly and southerly direction. The cliffs, except at Point Emery and Point Elliot, where the land is more open, are fringed by a dense thicket of from 5 to 20 yards through, of various sized timber, matted together by bamboo, convolvuli, and a variety of other vines and shrubs. The low lands near the sea—especially such as are under the influence of the tides—by dense mangroves of two or three varieties; these give place, as you go inland and ascend to the higher levels, to paper-bark (some of large growth), palms, fan and fern, screw-pines, iron-bark gum, stringy-bark, fig, cedar, cotton, and a variety of other trees and shrubs, forming an open forest. The grass over the whole, or nearly the whole, of the surface of the ground grows luxuriantly, from a rank species resembling *kaleea* to the finer varieties—from all, or most of which, seed has been sent to Adelaide. The soil is mostly good, and of a dark-brown

colour, with small nodulous stones of ferruginous sandstone upon the surface; in places masses of this stone crop out, and about an acre is level and cemented into a surface resembling iron, broken only by timber growing through, but destitute of other vegetation. Near the sea, and generally upon a watercourse near its junction with the sea, swampy flats occur, containing timber of large growth and rank vegetation; but these, being liable to inundation during the rainy season, have been excluded from the survey. This general description of the country applies to all the table-land as far south as Fred's Pass, the slopes and valleys being of better soil, and free from surface stones."

"The climate during the months of May, June, July, August, and September has been very fine, and, generally, delightful; not too hot during the day, and invariably cool at night. The weather is changing now, however, the atmosphere becoming more moist and the heat more intense. Nearly all the men are well; some of them stand the climate remarkably well, especially those of a spare habit. Personally, I have not enjoyed good health, and twice acute and painful illness attacked me, which speedily succumbed to the care and skill of Dr. Peel, to whom I shall ever feel grateful for his unremitting attention to his duties to the officers and men of the expedition."

Mr. Goyder, it will thus appear, thinks favourably of the resources of the country, and the spot which he has selected as its chief centre, Port Darwin, seems to have all the qualities constituting a good harbour. In speaking of the future of North Australia (which, by an absurd application of terms, is part of *South* Australia), it is necessary to be somewhat guarded. The area already known is limited, but the portion examined seems suited for the rearing of horses and cattle. The idea of forming a regular communication from the southern side of Australia through the central desert must, I fear, be given up. Mr. Goyder speaks of M'Kinlay's route by Hope's Lake, as the most eligible. So that, in reality, the territory described is dependent entirely upon Queensland and New South Wales for all its supplies, and its connexion with Adelaide. The time required for communicating by water is almost as long as that required for making a voyage to Europe.

Before dismissing the subject of exploration in Australia, it may not be amiss to take a rapid view of the progress and present state of geographical research in this important section of the earth's surface. It is just 100 years since Cook first landed in Botany Bay in April, 1770, and 82 years, the mere span of a human life, since the first British settlement was formed at Port Jackson. During this last-mentioned comparatively brief interval, all the great Australian Colonies, including those of New Zealand and containing a population of more than a million and a half of souls, have been called into existence, forming great and thriving communities, whose marvellous growth and prosperity are without parallel in the history of colonization. The early progress of settlement in Australia was, however, slow and painful. The first Europeans planted on the Eastern coast

found themselves placed in a belt of country varying from 30 to 70 or 80 miles in breadth, and cut off from the interior by a range of mountains extending north and south as far as the eye could reach. It was more than twenty years after the first settlement of New South Wales before the great barrier to the westward was surmounted. Extending along the whole Eastern coast from Cape York, in 11° s. lat., to Cape Wilson, in 38° s. lat., this great "Cordillera" attains in some points an elevation varying from 3000 or 4000 to 8000 feet in height, and presents steep mural escarpments along the whole of its eastern face, with scarcely any break in the outline. When this natural rampart (long considered inaccessible) had been surmounted, and the table-land of Bathurst, gradually shelving off into vast interior plains of Central Australia, discovered, the first and most important impulse was given towards the settlement of the country. The settlers at Port Jackson had, in the interval between their arrival in the colony and the discovery of a route across the Blue Mountains, occupied themselves in exploring the coast to the north, where they fell in with many estuaries of rivers, some of considerable size, and all deriving their waters from the eastern side of the dividing range. Dr. Bass, an enterprising naval surgeon, had in the mean time, in a common whale-boat, explored the whole South-Eastern coast, as far as the opening of the Straits that divide Tasmania from the mainland of New Holland, and which afterwards became appropriately known by his name.

The access afforded to the interior by the passage across the mountains brought to light the existence of immense tracts of fertile land and led to the discovery of large rivers (the Lachlan and the Macquarie) flowing to the west. These rivers were subsequently traced by Oxley for a considerable distance to the west and south. The knowledge of the fact of their junction with the Darling was reserved to a later period. To the north the late Mr. Allen Cunningham discovered the rich table-land of Darling Downs, and fell in with a system of rivers and watercourses, all flowing in a westerly and south-westerly direction. Towards the south in 1827, Messrs. Hovell and Hume traversed the whole distance between Sydney and the shores of Port Phillip, encountering in their journey numerous large rivers, the Murrumbidgee, the Murray, and the Goulburn. The entire course of these rivers to their junction with the Darling, flowing from the north, and the emptying of the last-mentioned stream into the basin of Lake Alexandrina, was determined by Sturt, when accompanied by McLeay, in the important expedition of 1831-2. The successive journeys into the Western and South-Western interior by Sir Thomas Mitchell in 1836 and 1838,

developed more fully the physical character and capabilities of a great part of the region now constituting the colony of Victoria, and which, on its first discovery, had been so appropriately named "Australia Felix." The principal geographical features of the whole coast country of South-Eastern and Southern Australia were finally determined by Mr. Eyre in his adventurous journey from Spencer's Gulf to King George's Sound, and by other meritorious explorers.

Up to the year 1843 little was, however, known of Eastern and North-Eastern Australia beyond Moreton Bay and the 30th degree of south latitude, when Leichhardt started on his first expedition from Sydney to Port Essington. The circumstances connected with this wonderful journey, the scanty outfit with which it was equipped, the difficulties it encountered, the immense tract of country previously unknown which it opened up, the prolonged absence of all accounts of the explorer and his small band of followers, with the universal conviction that they must all have perished, and their sudden reappearance in Sydney with the report of all the achievements of their long and perilous journey, must be more or less known to all here present. The same heroic spirit that prompted Leichhardt to undertake his *first* expedition, impelled him to a second enterprise of the same kind, in which his aim was to effect a transit through the whole central regions of Australia, from east to west. Twenty years have now elapsed since he set off on this journey, and no certain intelligence of the fate of him or his party has ever since been obtained. The moral conviction, the sad inference is inevitable, that the illustrious traveller and his companions must have long since perished. At what exact period, and under what precise circumstances, will, in all human probability, never be known.

As the circuit of the whole continent of New Holland has been completed by the successive journeys of the two Gregorys on its west, north-west, and northern sides, so has its central interior been intersected by the explorations of Macdougall Stuart in his journey from Spenser's Gulf to the Adelaide River in 1861, and by Burke and Wills in their expedition from Victoria to the shores of Carpentaria in 1860-1. From various other points, tentative efforts (some of them attended with a considerable degree of success) have been made, and are being constantly attempted, to ascertain the true character of the regions still unexplored. That vast areas of the interior still remain untrodden by any European is an undoubted fact. An ample supply of data exists, however, enabling us to predicate with some degree of certainty as to the probable physical

and geographical characteristics of the regions yet untraversed by civilised man. And there is little to justify any expectation that these will be found to differ in character from the inhospitable wilderness from the confines of which so many enterprising travellers have been obliged to turn their steps, and on the borders of which not a few have perished. It may, I think, be reasonably assumed, that the whole interior region west of the 140th degree of east longitude, and north of the 30th degree of south latitude, is of the most unpromising kind; that it is without rivers, without mountains, forming an inhospitable and dreary desert, similar to that traversed by Stuart, Sturt, Burke, Wills, and Mr. Forrest. And I cannot forbear expressing my conviction that, beyond the desirability of simply determining the fact,—and all knowledge, even of a negative character, is desirable,—there is little to tempt or repay an explorer in the desolate region included within the limits above mentioned. Portions—perhaps, not inconsiderable tracts—may be found along the coast, and extending for a few miles inland on the northern and western shores; but they will, I believe, be found to be a mere fringe, surrounding a wide-spread Sahara.

New Guinea.—Although the field of geographical enterprise has thus become circumscribed in Australia Proper, and may offer fewer incentives than formerly to the explorer, we have in close proximity, in what may be considered, in its physical relations and attributes, a dependency of Australia,—viz., New Guinea,—a vast and all but untrodden region, awaiting the arrival of the European traveller. Although discovered more than 250 years ago by Torres, it is surprising how little we know of this immense island, extending as it does through some 20 degrees of longitude, and 10 degrees of latitude. Only occasional glimpses of its extensive coasts were caught by different voyagers, although a small Dutch settlement was formed on its coasts near Triton Bay on the 137th meridian. Visited at different periods

By Bougainville	in	1768,	when the Louisiade Isles were discovered,
„ Capt. Edwards, in *Pandora*	„	1791	
„ D'Entrecasteaux	„	1793	
„ Belcher	„	1840	

it was not till June, 1845, when the portion of the coast opposite Cape York was visited by H.M.S. *Fly*, Captain Blackwood, that any very minute examination of the coast was made. This was followed by Captain Owen Stanley, in the *Rattlesnake*, in 1850, when the whole of the south-west coast of the great peninsula, extending through six degrees of longitude, was carefully examined, and a lofty range

of mountains, extending for several hundred miles, discovered. The height assigned to some of these is considerable:—

		Feet.
That of Mt.	Yale being estimated at	10,046
"	Owen Stanley "	13,205
"	Obiss .. "	10,246
"	Suckling .. "	11,226
"	Dagmar .. "	9,167
"	Simpson .. "	9,972

The existence of so considerable a range of mountains, the summits of some of them approaching nearly to the limit of perpetual snow, must have a remarkable effect on the climate and character of the country. The fact of there being a large river flowing through the centre of the island to the great Southern Bight, is inferred by the numerous estuary openings found at that point, and the immense volume of fresh water that there flows into the sea. By some one or more of these openings easy access might be afforded to a small steamer desirous of penetrating into the interior of the country. And although the Native population is numerous, and is hostile to strangers, little danger would probably be encountered by any properly equipped party, in any attempts they might make to explore this interesting locality. When it is borne in mind that New Guinea is almost within sight of the coast of Australia, that it is close upon the tract which connects the latter with China, India, and the Eastern Archipelago, it must be a matter of astonishment that so little has been hitherto done towards acquiring a satisfactory knowledge of a country with which we are in such close proximity, and with which every succeeding year must bring us into inevitably closer relations. The feeling of surprise at the apathy that exists respecting this vast and almost wholly unexplored island is increased when we recollect that within a few miles of its southern shores, at Port Somerset, one of Her Majesty's ships of war is now and has been stationed for a considerable time past. Surely it might be regarded as not inconsistent with the duties to be discharged at this station, that something should be done towards the opening up of a communication, by its instrumentality, with New Guinea. The interests of science and commerce would undoubtedly be promoted by such an attempt. "I know of no part of the world," says the late distinguished geologist, Mr. Jukes, "the exploration of which is so flattering to the imagination, so likely to be interesting in fruitful results, whether to the Naturalist, the Ethnologist, or the Geographer, and altogether so well calculated to gratify the enlightened curiosity of an adventurous explorer as the interior of New Guinea. The very mention of being taken into the interior of New Guinea

sounds like being allowed to visit some of the enchanted regions of the 'Arabian Nights,' so dim an atmosphere of obscurity rests at present on the wonders it probably conceals." It may be mentioned as an important fact, that whilst communication, almost in an open boat, might be carried on between Cape York and New Guinea, a clear channel, free from coral-reefs, and of considerable breadth, extends the whole distance from Cape Deliverance to Torres Straits, thus affording a safe navigation to the largest vessels. That New Guinea will be explored—if not under the direct auspices of the English Government, by the enterprise of Australian citizens at no distant period—is certain. The unknown character of the country, the hostility of the Natives, and the insalubrity of the climate (although of this latter there is no direct evidence), may, it is not to be disguised, render the enterprise one of danger, and even entail the risk of self-sacrifice. Such hazards can never be a permanent bar to the accomplishment of any great design.

There seems, indeed, to be an eternal and inexorable law that every great truth, whether in science or religion, should have its martyrs. And it is, perhaps, the recognition of this fact that makes the pursuit of geographical knowledge so justly popular. Courage, endurance, an enterprising and inquiring spirit—some of the highest moral qualities that command respect in our common humanity—are indispensable requisites in the successful geographical explorer. In no part of the world has the cause of geographical research had more ardent or more illustrious followers than Australia. Nearly all the discoveries that have preceded the settlement of that great country, and that have initiated and prepared the way for making it the happy home of millions of our fellow-creatures, were achieved by men whose sole stimulus, amidst discouragements and dangers and difficulties of the most trying kind, was the simple desire of knowledge—a knowledge of the physical character and capabilities of the surface of the planet on which we dwell. And as long as the English language is spoken in those great states now established in the Southern hemisphere, as long as men shall continue to admire enterprise, heroic self-devotion and love of science, the names of Leichhardt, Burke, Cunningham, and Kennedy, and of others, who, without sacrificing life, have sacrificed health and strength and fortune—such as Flinders, Sturt, Mitchell, Eyre, Macdougall Stuart, and the Gregorys—be held in grateful remembrance. Let me add the expression of a hope that the list is not yet complete of those to whom posterity will owe a debt of gratitude for conquests yet to be made in Australian geography, and that the Royal Geographical Society may still have to record in its annals great results in the

way of discovery, in those regions especially which have been the subject of the foregoing remarks.

The PRESIDENT, in returning thanks to the author of the paper, said he was sure that Sir Charles Nicholson, who was formerly Speaker of the House of Representatives in Sydney, would treat ably the subject of the great country which he represented, on the present occasion. For his own part, he had been quite refreshed by the clear general view which Sir Charles had given of the successive discoveries and successive advances made in that great country. Having presided over the Society many years, and been associated with it from its commencement, the communication had called up many reminiscences of a gratifying kind. There was only one point upon which he would make an observation. It was this, that he much objected to the way in which the lines of political division were extended across the map of Australia. He could not understand why South and North Australia were included in one division right across the continent. North Australia, though not likely to be made a colony that would flourish, on account of the great heat, yet contained extensive harbours and points suitable for government establishments. He had always contended, though that country might not afford sufficient herbage for sheep and cattle, nor be so productive as other parts of the continent, that it was imperative upon this country to establish great ports on the coast, with a view to the maintenance of our maritime ascendancy; and never to allow North Australia to fall into the hands of any other nation whatever, occupying as we always did three sides of the great Australian continent. It was on this account that he had regretted the abandonment of Port Essington. Although not suited for a colony, he held that a country like ours ought to have marine establishments there, and stations in connection with our Indian empire. He did not see the necessity why, because Macdougall Stuart explored from Adelaide to the north coast, this northern region should be ceded to the colony of South Australia. The last point in Sir Charles Nicholson's paper, in reference to New Guinea, deserved the attention of every geographer, and it would certainly be a great honour to England to make important discoveries in that almost unknown land. If, however, his dear old friend the late John Crawfurd, whose name he could not mention in that assembly without sincere regret for his loss, had been alive, he would have sharply criticised Sir Charles Nicholson's views regarding New Guinea, and would have told them that it was a pestilent region, in which no European could ever reside.

General LEFROY remarked that the great geographical divisions on the map of Australia were purely municipal; they were determined by nothing which had any foundation either in physical geography, or in ethnology, or in history, or in politics. The circumstance reminded one how singularly they were in their infancy in that part of the world. It was impossible to suppose that those territorial divisions were going to last; or that the people who dwelt on the head-waters of the Darling and other rivers would remain content to be cut off from their natural outlet to the ocean by a hard and fast line on the meridian of 142°. We must suppose that this condition of things would have but a very temporary reign, and that we shall see in that portion of the globe struggles and convulsions similar to those which had brought about the political divisions of our own continent. But to make this observation was not the object of his rising. Sir Charles Nicholson, in the course of his remarks upon Western Australia, dwelt with just praise upon the enterprise of many gentlemen who had pushed research into that great region; but he had omitted the name of one gentleman who, in 1863, conducted an expedition from Perth considerably beyond any previous boundary, with much risk to himself and his party. He referred to his own brother, Mr. Maxwell Lefroy. There was such a point as Mount Lefroy. It was due to that gentleman to

say that his exploration, although it was never reproduced in this country, was the subject of a colonial Blue-book. It was certainly interesting in itself, was attended with much physical hardship and endurance, and it really brought back some results. Anybody who contemplated the continent of Australia must see that, whenever it pleased Providence to cause it to emerge from the waves, the south-east corner must have been lifted up first. In that way this region was furnished with rivers, valleys, and mountains, and with an enormous rainfall, and it only wanted a population to turn it to good account. But the more westerly region was equally gifted in climate and fertility. It had suffered under a certain odium, from having been the point to which our criminal population had been longest sent. That practice had now ceased; and there really existed no longer any reason why the attention of this country should not be again directed to it; it wanted nothing but labour to render it productive. He was happy to say that, under the auspices of the Home and Colonial Emigration Society, attention was once more being directed to that quarter of the globe. Upon looking at the map, anybody could see the want of population by the absence of names. A colony, founded about 40 years ago, only now contained about 6000 people. Therefore, he stood up to say a word in behalf of forgotten Western Australia.

Mr. GEORGE CAMPBELL wished to ask for some additional information with regard to the character of the extreme north of Australia, bearing upon the project of breeding horses there for the Indian Government. He gathered from Sir Charles Nicholson that Port Darwin was the place where it was proposed by the South Australian Government to breed horses for the supply of India. It was known that the Australian horses were strong powerful horses, just the kind that was wanted in India. But those horses were bred in the south-east of Australia; whereas Port Darwin was to the extreme north, in latitude 12° or 13°. We knew that was not the latitude in which horses were usually bred. Therefore, the information he sought was of a practical character, with regard to the climate of the country, from which we might gather whether it was a practical scheme, or whether it was a kind of fancy scheme. There might be an elevated country there, with certain peculiarities which really fitted it for the breeding of horses, but he should like to know what these were.

Mr. LYNCH said he should like to make another remark. He heard General Lefroy say there was a great rainfall in Western Australia, but that, from its short continuance and rapid drainage off the land, it could not be made available. It occurred to him that the rainfall might be turned to good account by leading the water into large basins or tanks, and adopting the peculiar system in use in Persia, of afterwards, during the dry season, leading it in underground canals, so as to save all evaporation, to the lower grounds, and in that way secure an irrigation of the country.

Mr. DUTTON said he possessed very little information about the country in the neighbourhood of Port Darwin. The survey had only been recently completed, and no actual settlement had taken place yet. With regard to the exportation of horses from Port Darwin, the scheme had been favourably reported upon to the Earl of Mayo by Sir James Fergusson, the Governor of the colony. He had no doubt Sir James had done so upon having ascertained from parties practically conversant with horse-breeding that the scheme was perfectly feasible. He was not himself a squatter, and did not know much about the breeding of horses. The Arab breed of horses was a very fine one, and they were bred in a very hot climate. Therefore, he really did not see any reason to suppose that good horses could not be bred in the northern part of Australia, although the climate was very warm. He expressed that opinion with great diffidence, because he did not profess to know much on the subject. But, with regard to Port Darwin as a

port of export, it was part of the scheme that horses bred in the southern parts of Australia—in New South Wales, in Victoria, and on the Murray—should be gradually driven up by short stages to Port Darwin, which would be made a sort of entrepôt, and from there be exported to India. He had no doubt that in a very short time Port Darwin would become a very important port of export for horses, and probably also for sheep and cattle, to India.

Mr. FINDLAY mentioned that the island of Timor, which was the nearest island, was a great mart for the supply of ponies to India.

Sir CHARLES NICHOLSON, in reply to the observations of General Lefroy, said he quite acknowledged having omitted to mention the name of Mr. Lefroy. In fact, he found himself under the necessity of compressing what he had to say within a very short space of time; he was obliged to omit the name of Mr. Lefroy, and the names of many other equally deserving explorers, such as Mr. Landsborough, and others who had done a great deal in the way of geographical discovery. With regard to the transport of horses from Port Darwin, he did not collect from the report of Mr. Goyder, the Surveyor-general, that it was ever intended to breed horses in that district. It would be impossible for supplies from the other parts of Australia to reach Port Darwin through the great central desert. The communication must be along the coast, which is already occupied, and where horses exist in the greatest abundance. Like the horses on the pampas of South America, horses had become wild in Australia; and one constantly heard of "mobs of horses" being sold for a few shillings a head. The idea was to make large gatherings of horses, and to drive them to some point on the north coast, where they would be shipped for India. He imagined the most desirable point would be somewhere at the head of the Gulf of Carpentaria. Mr. Goyder had pointed out that the route must be by M'Kinlay's route; it was distinctly understood that the horses could not go across the desert, and that they must go round by the eastward. In fact, this region ought to be made a part of Queensland instead of a part of South Australia; the two regions were more divided from each other by the existence of this great central desert than any two other colonies were.

Mr. SAUNDERS said he quite agreed with Sir Charles Nicholson that the head of the Gulf of Carpentaria would be a more favourable point for the exportation of horses than Port Darwin. One of the objects to be secured, in selecting a port for shipping horses from Australia to India, would be a favourable passage. The passage from Port Darwin must always be exposed to the storms and hurricanes of the Indian Ocean; whereas the passage from the Gulf of Carpentaria, taking the course of the Archipelago, could be made in open boats at all times of the year. Apart from the facility with which the Gulf of Carpentaria could be reached from all the populated parts of Australia, that advantage alone was of the greatest importance in the consideration of the question.

Tenth Meeting, April 11th, 1870.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Rev. John Light; Charles Stenning, Esq.*

ELECTIONS.—*William Atkinson, Esq.*, F.L.S., &c.; *William Cunliffe Brooks, Esq.*, M.P., &c.; *James Alexander Croft, Esq.; David M. Henderson, Esq.; Hon. and Rev. Llewellyn Charles Robert Irby; the Rev.*

John Light; Benjamin Moran, Esq.; Edward Sewell, Esq.; Edward Frederick Teschemacher, Esq.; Arthur Wells, Esq.; and Lieutenant William Wiseman, R.N.

ACCESSIONS TO THE LIBRARY FROM 28TH MARCH TO 11TH APRIL.—'Facts and Dates.' By Rev. A. Mackay. 1870. Donor the author. 'Slavery in Turkey.' By F. Millingen. 1870. Donor the author. 'Guide to Florida.' By D. G. Brinton. 1869. By purchase. 'The Future of England.' By J. Ruskin. 1869. Donor the author. 'Denominational Statistics of England and Wales.' By E. G. Ravenstein. 1870. 'Terraces of Norway, by Professor Kjerulf.' By Marshall Hall. 1870. Donor the author. 'Report of the Upper Yangtsze.' Shanghai. 1869. Donor A. Michie, Esq.

ACCESSIONS TO MAP-ROOM SINCE THE LAST MEETING OF MARCH 28TH.—Tracing of the River Limpopo. By Mr. St. Vincent W. Erskine: showing his route. On 2 sheets. Presented by the author. Map of the Alatau District and Issyk-Kul Lake, Turkistan. By Semenoff. Presented by Mr. E. D. Morgan. A map showing routes from the Punjab to Eastern Turkistan. By T. D. Forsyth, C.B. A tracing of the River Juruá (a tributary of the Amazons), S. America. Presented by W. Chandless, Esq., M.A. On two sheets.

The first paper read was—

1. *Report of the Trans-Himalayan Explorations made during* 1868. By MAJOR T. G. MONTGOMERIE, R.E., G. T. Survey of India.

Early in 1868 preparations were made for sending an exploring expedition beyond the eastern watershed of the Upper Indus River. The explorations of the Pundits, during 1867, had supplied tolerably certain information as to various Tibetan districts lying between Rudok and the Thok-Jalung gold-field, and between the latter and the Tadum Monastery, on the great Lhasa road; more vague information had also been received as to an upper road running from Thok-Jalung through various gold-fields to the great Tengri-noor, or Nam-tso-Chimbo Lake, and thence to Lhasa. Having the above information to go upon, Major Montgomerie decided upon sending the exploring party to Rudok, and thence through the districts of Rawung and Tingche, to the north of the great Aling-Gangri group of peaks, which were discovered last year. From Thok-Jalung the exploration was to be carried, if possible, along the upper road to the Tengri-noor Lake and thence to Lhasa; failing that, to take the route through Majin and Shellifuk towards the Tadum Monastery. The Chief Pundit required a rest after his last expedition, and the third Pundit was consequently selected for the work.

This Pundit assumed the character of a Bisahiri, and, taking a few loads of merchandize, started in April with a party of real Bisahiris (or men of Koonoo), whom he had induced to accompany him. He made his way from Spiti, through the upper part of Chunmurti and Ladak, to Demchok on the Upper Indus. Here the third Pundit measured the velocity of the Indus by throwing a piece of wood into it, and then noting how long it took to float down 300 paces. The velocity turned out to be $2\frac{3}{10}$ miles per hour, with a depth of 5 feet, and a breadth of about 270 feet in the month of July. From Demchok he went northwards through Churkang and Rooksum (or Rokjung), to Rudok.

Rudok had hitherto never been actually visited by any European; for although Captain H. Strachey reached a point about 12 miles to the east of the Fort, and Captain Austen another point about the same distance to the north, they were neither of them able to advance any farther, and could never get an actual view of the place itself, owing to the jealousy of the Jongpon who resides there, and governs this most north-westerly district of Tibet. Though there was but little doubt that the position assigned to Rudok was nearly correct, it was hardly satisfactory not to have a trustworthy account of the place; and the third Pundit was ordered to get all information about it, and to take observations for its latitude and height, and this he succeeded in doing.

He found that the Fort was built on a low rocky hill, rising about 250 feet above the flat ground at its base, having the Buddhist monasteries of Sharjo, Lakhang, Marpo, and Nubradan close up to it on the east, south, and west, with about 150 scattered houses along the foot of the hill.

The third Pundit remained a couple of days at Rudok, and in his assumed character as a Bisahiri, he and his party excited no suspicion, though they were summoned before the Jongpon.

Leaving Rudok on the 22nd of July the party marched back to Rooksum, and then turning eastward by a new road, advanced through the districts of Rawung and Tingche to Dak-korkor, a large standing camp, where an annual fair is held. Several small lakes and a large salt lake called Rawung-Chaka, or Phondok-cho, were passed on the way. These lakes supply salt to Bisahir, Spiti, &c. During the last three marches to Dak-korkor no water of any kind was met with, and the party were forced to carry a supply in skins. In this arid part of the country the soil was of a dazzling white, a peculiarity which extended as far as the Pundit could see.

The Pandit, whilst marching from Rudok to Thok-Jalung, saw no high peaks to the north or east, evidence which all tends to

prove the existence of a large plain in that direction, the term Chang-thang meaning moreover the Great Plain. According to modern maps this plain extends a great way east, nearly up to the end of the Great Wall of China near the city of Sewchoo, to which place the Chief Pundit appears to have got a rough route when in Lhasa. In his first journal he referred to a place, which he called Jiling, about one month's journey north of Lhasa. This turns out from farther inquiries made by Major Montgomerie to be the same as Siling. The Chief Pundit says that the Lhasa people call it Jiling, but he heard others calling it Siling, and from what he says it is evidently identical with Siling or Sining in North Latitude 37°, East Longitude 102°, which Astley describes as "a great and populous city, built at the vast wall of China, through the gate of which the merchants from India enter Katay or China."

Lord Strangford, who took great interest in the travels of the Pundit, and was able to identify nearly all the places mentioned by him, was greatly puzzled by the Pundit's description of Jiling, given in his first journal, where it is said to be in Tartary and to produce gold lace, silks, carpets, and other products of a tolerably civilized country. At first the Pundit understood that it was a month's or two months' journey to the north of Lhasa, but from farther inquiries during his second expedition, he made out that it was considerably to the east of north, and having this hint, there was no great difficulty in identifying it with the large town of Sining on the borders of China proper, the only place from which such civilized products were likely to reach Lhasa from the northwards.

The Dak-korkor Camp, which the third Pundit reached, lies about 20 miles to the north of the Aling Gangri peaks, on the right bank of the Aling-chu River, and not very far from the Thok-Nianmo gold-field. He arrived just as the annual fair was commencing: about 150 tents were already pitched, and both the Jongpon and Sarpon were present; but in spite of their presence a band of mounted robbers came down upon the camp and threatened to loot it. These robbers seem to be numerous all over Tibet. This particular band was said to come from the great Namtso Lake district. The men actually began to rob, but the Jongpon told them to stop, and he would make each tent contribute something as black mail. The Jongpon then made out a list of those assembled, and ordered each tent to contribute a parcha (of about 5 lbs.) of tea, and each trader to give from 1 to 2 rupees according to their means. This arrangement was agreed to, and the proceeds, having been collected, were handed over by the Jongpon to the robbers, who took their departure.

The third Pundit, starting again from Dak-korkor, continued his march eastward down the Aling-chu River till it fell into the Hagong-cho, a large brackish lake which appeared to have no exit for discharging superfluous water, though the Aling-chu River which feeds it was found to be 150 paces in width, with a rapid stream just before it fell into the lake. The shores of the lake had marks which showed that it had once been more extensive. Continuing his journey the Pundit passed the Chak-caka salt lake, from which the greater part of the Tibetan salt, which goes down to Almorah, Nepal, &c., is extracted. The next place of importance seen was Thok-Sarlung, which at one time had been the chief gold-field of the district, but had been in a great measure abandoned on the discovery of the Thok-Jalung gold-field. The Pundit passed a great excavation, some 30 to 40 feet deep, and 200 feet in width, and two miles in length, from which the gold had been extracted. He heard of another gold-field to the west, but his route took him direct to the Thok-Jalung gold-field, which he found in much the same state as when visited by the Chief Pundit. The Pundit and his party excited no particular notice, and they were consequently able to march on, after halting a day to rest.

From Thok-Jalung they passed through the Majin country, partly undulating, and partly quite level, but all about the same altitude, viz., 15,000 to 16,000 feet above the sea. The drainage sloped towards the east, and nothing but comparatively low rounded hills were visible in that direction; whilst on the west the party skirted a large plain of a yellowish colour, said to be drained by the Upper Indus.

The party passed numerous lakes producing salt and borax, and after nine days' journey in a south-easterly direction, found themselves at Kinglo, a large camp on the banks of a river called the Chu-sangpo, which is so large that it cannot be forded during the summer. This river flows eastward and falls into the lake called Nala-Ring-cho, or Cho-Sildu, said to be about the same size as the Mansarowar Lake; it has a small island in the centre. The lake is reported to receive a large stream from the south, another from the east, and a third from the north. Though receiving so many streams (one of which, as noted above, is a large one), the lake is nevertheless said to have no exit. From Kinglo the Pundit wished to march on to Lhasa by the northern route past the Tengri-noor Lake, but the Chief of Majin (Kinglo) would not permit it, and the party were consequently obliged to take a south-westerly route to the Mansarowar Lake. They followed the course of the Sangpo-chu nearly to its source, crossing one very high range

called Nakchail, and another called Riego, and finally descending to the Mansarowar Lake. The Nagchail and Riego ranges are evidently off-shoots of the Kailas peak. The Nagchail peaks appeared to be very high both on the east and west.

Throughout his march, the Pundit was at an elevation of over 15,000 feet, and yet an encampment was met with nearly every day. Thieves were numerous, and threatened the party several times; but on seeing that the Pundit's party were armed, they invariably went off again, not liking the look of an English gun. The party arrived at Mansarowar in safety; and the Pundit decided upon waiting for the Ladak Kafila, which was known to be on its way to Lhasa. Whilst there, the Pundit made a careful traverse of the Mansarowar Lake, with bearings to the peaks north and south. A map of the lake will be given hereafter. Though the water was sweet, no exit was seen: at one point on the west the ground near the Ju Monastery was low, and looked as if water had perhaps at one time flowed through, towards the Rakas Tal Lake, though it is now too much above the lake to admit of it.

The Pundit was unable to join the Ladak Kafila; but made his way by himself along the great road to Shigatze, where he was stopped. This he found was by an order of the Gartok Garpon, sent after him by the couriers. He was unable to advance farther. Whilst marching between the Mansarowar and Shigatze he was able to take bearings to various peaks north and south of the road, which no doubt will add considerably to our knowledge of the mountains on either side of that route; but as the Pundit has only just returned, there is no time to give any further account of his route and adventures in the present report.

Another explorer was employed to the east, who made a route-survey of 1,190 miles in length, advancing by one route 640 miles, and returning by another 550 miles in length. A small portion of this man's route was quite new, as he managed to penetrate behind or north of the great Mont Everest peak. His progress in that direction was checked by the obduracy of the Lhasa officials on the Tingri-maidan. As far as it goes, this portion of the route is, however, interesting: insomuch as it gives another determination of the Himalayan watershed, and throws a little more light on that part of the mountains which lies behind or north of the great peaks seen from the Hindustan side.

The remainder of the route is in a great part new; but some of the former explorations went over portions of the same ground, and the positions of several places have been entered on published maps from various information, though hitherto without any regular

connection. These new routes will supply the necessary connection, and, when combined with former explorations, will add much towards the elucidation of the Eastern Himalayas. A map will be prepared on this basis, but no reference can, for obvious reasons, be made to names, &c., whilst the work is in progress, the explorers having been somewhat impeded by the publicity given to the results of former expeditions.

The more detailed Report, with Map, alluded to by Major Montgomerie, will be printed in the 'Journal.'

Mr. R. B. SHAW said he could confirm the description given by the Pundits as to the whiteness of the plains of Tibet. It was one of the most remarkable features of the plateau which he crossed between Chang Chenmo and the Kuen-lun. The plain, in one part, was entirely covered with what looked like snow, with an underlying sheet resembling ice, but which was in reality soda, with some kind of crystallised salt beneath. This plain was from 10 to 12 miles across, and formed very difficult walking. There could be no doubt that the country eastward of Ladak abounded in gold. He had seen a great number of old washing-places on the Indus, where certain tribes of natives obtained a livelihood out of the gold-washings. The Indus flowed down from the regions visited by the Pundit, and therefore it was natural to suppose that it derived its gold from those regions. The great obstacle to Europeans in attempting to get into that district were the gangs of thieves who were encouraged by the Chinese authorities. The officials looked upon the black mail levied upon travellers as quite part of their dues. The thieves were generally armed with two swords, but they had a great dread of European fire-arms. He was told by some natives that, on one occasion, all their flocks of sheep, laden with goods, were seized by robbers. In great trouble they were returning to their own side of the hills, when they met an English officer on a shooting expedition, with two or three servants armed with rifles. The next night, although the sufferers had taken no further steps to recover their property, they found it all returned to them by the robbers through fear of the rifles. With regard to Lake Mansarowar, he had been told by a native that the water there was different from any other water, because it formed itself into mountains like the land. This, no doubt, implied that it had waves.

Sir H. RAWLINSON said, the essential point in the late discoveries by the Pundits was, that they seemed to afford a proof, or, at least, a strong presumption of the truth of the theory that, from Rudok to the northward, there were no mountains. It was originally stated by Moorcroft, and, subsequently, by other Tibetan travellers, that it was notorious in the country that there was in ancient times an Imperial road leading by Rudok outside the mountains to Khotan, in which case there could be no barrier at all. He himself believed that, when once the traveller crossed the Indus, and the inner or northern crest of mountains, he was fairly on the plateau of Tartary, and that the land descended gradually to the Great Desert, so that wheeled carriages might traverse it without crossing over any pass at all. If such were the case—and the evidence, which was constantly accumulating, pointed to that result—it became infinitely important to complete the Hindustan road, which was planned by the Indian Government some years ago. It had already been carried through the most difficult parts of the Himalayas, only about 50 miles still remaining uncompleted. At present it was of no commercial use, because its terminus was in an uninhabited mountain-region; but, if it were continued to Shipki, trade would soon avail itself of it, as there would then be a good road practicable

for wheeled carriages not only across the Himalayas and on to the Tibetan plateau, but, as he believed, passing by Rudok outside the Kuen-lun and the other great ranges, and conducting fairly into the centre of Central Asia. He believed the establishment of this great line of commerce to be quite practicable to the science and enterprise of the present day. It was true that from Rudok to Tartary the route would lie along the Chinese frontier, which was at present very jealously guarded; but it was not to be supposed that Chinese exclusiveness would continue for ever. If the Cashmere authorities on the one side, and the Central Asian authorities of Eastern Turkistan on the other, were in unison, and ready to facilitate the commerce between England and Central Asia, it would not be possible for Chinese jealousy to keep the Indian trade out of that route. His attention having of late been drawn to the early condition of Tibet and Central Asia, he had fortunately happened to light upon a MS. work in Persian which was almost unknown in England, but which had been much used by continental geographers—the Tarikh-i-Rashidi. It was a perfect mine of geographical information with regard to Tibet and Eastern Turkistan some three or four hundred years ago. The author was a prince of the country, and had the supreme command there for several years, being a cousin of the Emperor Baber, and being entrusted with the command of the army which marched from Kashgar and Yarkend to Cashmire, and subjugated all the intermediate districts. He had investigated the geography of the whole region with great care, and had made many most interesting journeys, one being from Little Tibet by the Karakorum Pass, and the mountain districts of Raskam and Tagh-dum-bash to the sources of the Oxus, and so on to Wakhan and Badakhshan. He hoped shortly to be able to translate for the 'Journal' of the Society some chapters of this work, which would be found full of interest, and exceedingly valuable.

Mr. T. SAUNDERS said, when it was known that the plain across which the Pundit had travelled was from 15,000 to 16,000 feet high, the question naturally arose, How did it drop down on the north, to 4000 feet at Khotan? It appeared to him that a continuous slope, from the Gangdisri Mountains on the south, to the plain of Khotan or Gobi on the north, would be more remarkable than a sudden descent from another range of mountains forming the northern edge of the plateau, and in continuation of the range actually known to skirt the plateau between the Chang Chenmo plains and Khotan. The Pundits heard that at a little distance from the scene of their labours there was a river flowing northward and eastward into China. Now, if the plain gradually sloped down, the water would find its way down that slope, and not to the eastward. At present geographers were entirely indebted to the Tibetan surveyors for an acquaintance with the ground between the Pundits' tracks and the Abbé Huc's. Huc and Gabet, in their account of their journey to Lhasa, distinctly spoke of the very elevated and difficult region which they had to ascend, in order to get to the plateau of Tibet on their way from Peking to Lhasa. He therefore preferred, in the present state of geographical knowledge, to represent the northward edge of the plateau of Tibet as an escarpment descending rapidly to its base, than as a continuous slope. The Himalayas might be regarded as extending from the Gorge of the Indus on one side to the Gorge of the Sanpo on the other, and between these two gorges there was only one instance of a great river rising on the northern base of the Himalayas, and penetrating through the whole range,—namely that of the Sutlej. Eastward of the Sanpo, the waters, instead of flowing east and west through the mountains, ran north and south all the way to the plains of China, and, instead of the great plains of the western part of the plateau of Tibet, there was a succession of ranges and gorges so cutting up the country that, instead of passing directly from Batang to Lhasa, the traveller was obliged to go a long distance to the northward in order to turn those diffi-

culties, and so pass down in a south-westerly direction to Lhasa. He believed there was a continuation of the Himalayas in a circuit of mountains enclosing the whole of Central Asia,—the Himalayas on the south, the Pamir on the west, the Altai on the north, and the Inshan and Yung Ling on the east.

Dr. CAMPBELL, referring to the fact that one of the Pundits had examined the pass of Muktinath leading into Nepal, and had found that the ascent to it from the north was very easy, with cultivation on both sides; and that the summit of it was not above 13,000 feet, said that this threw great light on an important event which occurred at the end of the last century, and which people could hardly understand. A Chinese army equipped at Pekin had invaded Nepal, and penetrated to within 20 miles of Kathmandu. As all the passes we knew of into Tibet are at least 16,000 feet, and very difficult, we concluded that the feat was marvellous. With the knowledge of this very easy pass of the Pundit's we can more readily comprehend an invasion from the north, although this one is still a very surprising one. Dr. Campbell remarked that while we took so much pains to explore the passes of the Himalaya from the south, we should do our utmost to gain a knowledge of the approaches from the north along the whole extent of our frontier.

Sir H. RAWLINSON said, in the work to which he had alluded, the general mountain system of Central Asia was laid down very much in the way Mr. Saunders had described it. The author stated that there was but one great mountain system of Central Asia; it commenced on the north in the great chain of the Thian Shan, or "Celestial Mountains," which came from Mogulstan, and passed along to the north of Eastern Turkistan. The range then circled round to the west, passing between Kashgar and Khokan, and forming the Pamir. Further on it turned to the south-east and became the Himalayas,—the plateau of Tibet being regarded as a part of the chain; the mountains were also said to stretch to the eastward as far as China, but the termination in that direction was unknown. Rudok was regarded as the limit on the northern side of this chain, thereby showing that there could not be a further interior crest. With regard to the line of rivers, it should be remembered that from the Pamir eastward all the rivers of Central Asia ran to the east, the slope of the country being from west to east.

Mr. SAUNDERS said he believed the plains at the northern base of the Kuen-lun separated the Plateau of Tibet from another plateau equally remarkable and quite as distinctly defined. What the Himalayas were to the southern edge of the great mass of Central Asia, the Altai were to the northern edge, and what the Kuen-lun was to the inner slope of the great mass of Tibet, the Thian Shan was to the inner slope of the great mass of the Altai. He believed that the interval between the Thian Shan and the Altai was as much a plateau as that of Tibet, but no doubt very different in its character.

The PRESIDENT said the differences of opinion manifested in the discussion showed how little was really known by European geographers with regard to this region. Some time ago, Mr. Gladstone complimented the Society by saying, "Gentlemen, you have done so much that you are like Alexander, you have no more worlds to conquer;" but if he had been present that evening he would have learnt how vast was the region yet to be explored.

The following paper was then read:—

2. *Account of an Attempt by a Native Envoy to reach the Catholic Missionaries of Tibet.* By Captain J. GREGORY.

A native chief was sent on the mission here narrated, in con-

sequence of the receipt of the following letter from certain Catholic missionaries in Tibet:—

EXTRACT of a LETTER from Catholic Missionaries of French Nationality residing on the Chinese and Tibetan frontier, to Colonel R. C. Lawrence, C.B., Resident at Nepal, dated 18th March, 1869.

WE think that it is good to inform you of what we have been told several times of people of this country who went to trade as far as Ta-li-fu. They say that there are at Ta-li-fu some Europeans casting cannon for the benefit of the King of the Mahomedans. They give such particular descriptions of their features, habits, uniforms, &c., that we are inclined to believe that it is true.

We have been told also that last year a party of English travellers coming from Assam through the wild tribe of the Mishmis had reached the Tibetan district of Dzayul, but they had been turned back by the local authorities. Had these gentlemen been able to settle in that district of Dzayul, they would have found there a real confluence of roads, one going south of Tibet towards the west, to Lhasa; one going to the north, to the independent principality of Pomi; one in a north-east direction, reaching Tcha-mouto, or Tsiamdo; one reaching Kiang-ka and Batang, to the east; then another one going south to the Yunnan province and Ta-li-fu.

In order to show our gratitude to the English Government for their kindness to us, should some English gentlemen come to this part of the world we will help them heartily, as much as we can, and give them as much information as may be in our power. Last year we were very happy to do so for a nice young English gentleman, Mr. T. T. Cooper, who came to Batang. Being unable to proceed to Lhasa, this gentleman wanted to go to Ta-li-fu and Birma; but he was unfortunately stopped at the Chinese town of Weisi, in the Yunnan province. After being very ill-treated, he was turned back to Shanghae.

Since your Excellency has taken so much interest about us, you will be glad, we hope, to hear something of our doings in this country. From the time of the persecution which drove us out of Tibet Proper, in September, 1865, Messrs. Fage and Goutelle are living at Batang, five days' journey east from Kiang-ka, whencefrom they had been expelled. Messrs. M. Desgodins and F. Biet, who were expelled from Bonga, are now settled at Tsaka, on the banks of the Lan-tsan River (which is called Meikong at Saigon), in about 29° 19' lat. north. This station is but three days' journey south from Kiang-ka, and not more than three miles from the frontier of Tibet. On the banks of the same river, eight days' journey south of Tsaka, there is a new Christian station, the name of which is Tsekou. This station is not more than four or five days south-east from Bonga, the lonely property of our mission, which was plundered and burnt in 1869, and where we wish so much to go back. Bonga was situated on the banks of the Lou-tse-kiang (which is called in Birma Salween River), in about 28° north; Tsekou is a little more south, but on the banks of the Meikong River. Our venerable Bishop is living at Ta-tsien-lu, fourteen days east of Batang. Though all these countries are Tibetan by language and manners, they are under the direct government of the Se-chuen province.

We hope these geographical notes will be agreeable to you. Should your Excellency desire a more particular and complete account of the eastern part of Tibet, where we have lived for eight years, we will do it most willingly.

Capt. Gregory's Report is, in substance, as follows:—

"I have the honour to report, for the information of the Commissioner, the return of Chowsam Gohain, the Kampti chief, deputed

by my predecessor on a mission to Tibet, to endeavour to open communications with the French Missionaries, who, some time ago, applied to the Imperial Government, through the Resident at Nepal, for assistance.

"The Gohain failed to penetrate far enough into the country to meet the priests, having been stopped on the frontier by the officials of Tibet, but has returned, after a stay of a month at the Tibetan frontier outposts, with a letter from one of the Tibetan officials, and with much interesting and valuable information relative to the route and the people of that portion of Tibet which nearest approaches Assam.

"No opposition was offered to the progress of the Gohain's party by the relatives of Kaesa, whose hostility it was feared would bar the Mishmee country to us. Chowsam met Kaesa's sons on the upward journey, made them a small present, and promised to visit them on his way down. They informed him that two other Kampti border chiefs had been endeavouring to induce the Mishmees to oppose his progress by saying that he had come up to spy out the land to enable the English to 'devour it in their usual manner.'

"Chowsam Gohain started on his mission on the 24th of March last from Chungkam, his village, on the Tenga Pani River, accompanied by five Kampti followers, and taking with him the articles of trade supplied to him by the late Deputy Commissioner, and on the evening of the 3rd day reached the Brahmaputra at Brahmo, a Mijoo Mishmee village, the inhabitants of which collect toll from the pilgrims to the Bramakund; the two intervening nights having been spent in the jungle on the banks of small streams. The Mijoo Mishmees had heard of the Gohain's contemplated expedition, but, far from offering any opposition to it, assisted him with advice and provisions.

"From Brahmo to Bowsong, on the Lat Thipani, the Gohain followed the general course of the Brahmaputra River, leaving the bank only to avoid bends. His path led him through Mijoo Mishmee villages and scattered solitary houses in which he was entertained, and he had only once to lie out in the jungle; this happened in crossing a high hill on which there still lingered patches of snow. Bowsong was reached on the 3rd of April, the Gohain having halted two days at Sengsong. All the villages east of Sengsong are dependent on Tibet, and trade only with the Tibetans, never coming down to Sudiya; but they are of the Mijoo Mishmee clan, and do not differ in any particular from those of the same sept who are dependent on us and trade with Sudiya. Bowsong is the village marked on Wilcox's map, and the map com-

piled to accompany the memorandum of the Vicar Apostolic of Tibet,* as 'Jingsha.' The Mishmee villages are called after the head-man, and Bowsong, the son or grandson of 'Jingsha,' is now the head-man of this community.

"At Bowsong the Gohain made arrangements with Bowsong and Sengsong to accompany him, and pushed on to Teenai, the first Tibetan village. This was a journey of six marches, during which the Brahmaputra had to be crossed twice by cane bridges. The road for the whole distance led through Mijoo Mishmee villages in which the party was entertained. At Teenai the two Mishmee guides slept in the village, but the Kampti party was not admitted. The following day the Gohain marched to Rochma,† one of a group of villages from which the Tibetan frontier post of Erka is garrisoned. There the head-men of Rochma and Kangaun were so angry with the Mishmees, Bowsong and Sengsong, for having guided Chowsam Gohain, and intimidated and threatened them to such a degree that they insisted on the Gohain's returning immediately with them to their village, which he was very reluctantly compelled to do.

"During a whole month Chowsam endeavoured vainly, by bribe, presents, and persuasion, to induce the Mishmee head-men to make another attempt to obtain ingress to Tibet with him; but at last Bowsong, wearied by his importunity, one day took him aside and told him that his only chance of success was to return by himself, avoid the intermediate villages, and make his way straight to the frontier outpost, and boldly declare his real errand to the officer in command. The 'Jeengoo' in charge was alarmed and annoyed at the Gohain's re-appearance, and asked him how he dared to return after having been sent back once from Rochma, and ordered him to go back immediately. The Gohain, acting on the Mishmee's advice, showed his letters, and explained that he was commissioned to join and bring to Assam some European priests, the brothers of the ruler of Debrooghur, and that until he had accomplished his errand, he dared not return. The 'Jeengoo' denied the existence of any Europeans in Tibet, and reiterated his orders to the Gohain to return to his own country at once: this the Gohain firmly but quietly refused to do, and insisted on being allowed to proceed. At last the 'Jeengoo,' finding that nothing short of actual force would induce Chowsam to retire, and somewhat frightened by the earnest manner in which the latter impressed upon him the responsibility he incurred by refusing to allow him to pass, agreed to refer the

* See the 'Transactions Asiat. Soc. Bengal, 1861.'

† Called Roosmah in the above map (from native information).

question to higher authority at Serongba, and to allow Chowsam to remain, pending the receipt of an answer, at Erka; and he at once despatched mounted messengers, reporting the foreigner's arrival, and asking for instructions. No answer to this communication was received for fourteen days, during which time the Kampti party was entertained by the 'Jeengoo' free of cost, and the Gohain occupied himself in obtaining any information he could relative to the position and circumstances of the French priests, the routes into the interior, and the condition of the country and people, and in compiling a vocabulary of Tibetan words. He communicated with the people in the Mishmee language, but he was very much assisted in his inquiries by a Kampti boy, the slave of the Rochma-ooji, who had bought him from the Mishmees. At noon of the fourteenth day a party of five horsemen rode into Rochma, passing the Chowkey in which the Gohain was living without taking any notice of him, and he was told that the leader was a 'Naboo Jungbal,' a man of rank, higher than the Jeengoo, who had been sent down to dispose of his affair. The next day the Gohain received a peremptory order to leave at once by the way he had come, and the supply of provisions to him was stopped entirely. The 'Naboo Jungbal' replied again vicariously that there were no Europeans in Tibet, and no road for foreigners, for the Tibetan Government knew that if it once permitted the English to enter the country, they would 'covet and finally devour it, as they had devoured so many other countries.' The Gohain, on his side, sent word that he knew positively that the French priests were in Tibet, and the avowal of his intention to abandon his mission only with his life. But eventually he made his way back to his village as quickly as he could, and after a short stay there came on through Sudiya to Debrooghur. Whilst in the Tibetan villages he learnt that a great trade-route from the western provinces of China to Lhasa crossed the Brahmaputra by means of an iron bridge, about seven days' journey above Rochma. The villagers told him that the traders from China did not go to Lhasa, but were met at a great central mart, at or near a place they named Serongba, by the Lhasa traders. The Gohain saw quantities of tea in bricks and balls, and described to me the manner in which it is prepared and consumed, and stated that it is very largely used by the border Tibetans.

"From the Gohain's account of the rate at which he travelled, I calculate that he did not go much faster than 7 or 8 miles per diem, and that the point which he reached cannot be more than 170 or 180 miles from Sudiya. It would be needless to dilate on the advantages to be derived from direct commercial intercourse with

Tibet, and no opening likely to lead to it should, I think, be neglected."

Colonel YULE said the first time he ever heard of these missionaries was about ten years ago, when he was in Calcutta connected with the Asiatic Society of Bengal. A letter was then received from Sir Bartle Frere, enclosing one from the Vicar Apostolic of Tibet, the head of these missions, to the French Bishop at Rangoon. Previous to that no one in Calcutta knew there were any Europeans or missionaries in that *terra incognita* lying between the Yang-tsze-kiang and Assam. The letter described the position of Bungay, and conveyed a good deal of miscellaneous information about the rivers coming down to the eastward of Assam. Great difficulty was found in connecting the ascertained Indian geography up to the Assam frontier with what was mentioned in the letter; but it happened that in 1854 two French priests attempted to make their way from Sudiya to their brethren at Bungay. They stopped within the Tibetan territory to learn something of the language, but were both murdered by a chief, who was himself afterwards caught by Captain Doulton and hanged. They were murdered at a village called Samay. That place, though it had not been visited by Europeans, was marked on Captain Wilcox's map, which he made in 1826 or 1827, at the end of the first Burmese war. Samay was known to the Bishop who wrote from Bungay. However improbable it might seem to symmetrical geographers, there were three or four great rivers rising in the plateau of Tibet and running down parallel to one another, and within a narrow belt of country not more than 80 or 100 miles in extent, separately to the sea, those rivers being the Irrawady, the Cambodia, the Salween, and the Yang-tsze. The latter mentioned two other rivers, one of which the Bishop identified as the Schwaley, which entered the Irrawady, and the other was the river on which stood the village of Samay, which was known to be the eastern branch of the Brahmaputra. This seemed to identify the Sanpo with the Brahmaputra, which probably came from the north instead of from the east, as modern maps represented.

Sir H. RAWLINSON said, last year Mr. Cooper, who was the only Englishman that had ever been on the Chinese-Tibetan frontier, wrote that he was doubtful, with all his information, whether the Sanpo really was the Brahmaputra, or was the head-stream of the Irrawady. He himself thought the Sanpo must positively be the Brahmaputra, but the river had never been followed from Lhasa to Sudiya.

Eleventh Meeting, April 25th, 1870.

Sir RODERICK I. MURCHISON, BART, K.C.B., PRESIDENT, in the Chair.

ELECTIONS.—*Thomas M. Blackie, Esq.; Evelyn Baring, Esq., Lieut. R.A.; Colonel Shuckburgh Dennis; George B. Hudson, Esq.; Lord Lawrence, G.C.B., &c.; John Fenton Taylor, Esq.*

ACCESSIONS TO THE LIBRARY FROM 11TH TO 25TH APRIL.—'Map and Notes of the Lake Region of Eastern Africa:' showing the Sources of the Nile recently discovered by Dr. Livingstone. By Keith Johnston, Jun. 1870. Donor the author. 'Wild Life among the

Koords.' By F. Millingen. 1870. Donor the author. 'Scenes and Studies.' By J. W. Clayton. 1870. Donor the author. 'Description Physique et Naturelle de L'Ile de Crète.' Par V. Raulin. Vol. 2. Paris, 1869. Purchased. 'Ocean Currents.' By James Croll. 1870. Donor the author. 'Le Phénomène du Flot Courant.' Rome, 1869. 'Carta de Cristobal Colon, enviada de Lisboa a Barcelona en Marzo de 1493, &c.' Por el Seudonimo de Valencia. Vienna, 1869. Donor the author. 'Sull Importanza d' un Manoscritto inedito, &c., la prima isola scoperta dal Colombo.' F. A. de Varnhagen. Vienna, 1869. Donor the author. 'La verdadera Guanahani de Colon.' F. A. de Varnhagen. Santiago. 1864. Donor the author. 'Das Wahre Guanahani des Columbus.' Von F. A. de Varnhagen. Uebersetzung von * *. Wien, 1869. Donor the author. 'Voyage of a French Officer to the Isle of Mauritius.' 1775. By John Parish. 'Cox's Voyage to Teneriffe, &c.' 1791. By George Mortimer. 'Travels in North America.' 1791. By T. Longs. 'Voyage to California.' 1778. By Chappe d'Auteroche. 'Review of Chappe d'Auteroche's Journey into Siberia in 1761.' 1772. 'Voyages of the Portuguese and Spaniards during the 15th and 16th centuries.' 'P. de Charlevoix, Voyage to North America' (*translated*). 1761. 'Marine Treaties from 1546 to 1763.' 1779. 'Voyage Round the World.' 1757. By G. Shelvocke. 'Account of Discoveries in the South Pacific Ocean previous to 1764.' 'Account of the New Northern Archipelago in the Seas of Kamtschatka.' 1774. By J. Von Stoehlin. 'Terra Australis Cognita.' By J. Callander. 3 vols. 'Voyage to Madagascar.' By the Abbé Rochon. 'A Memoir of the China Trade.' 1792. All the above the donation of Charles Enderby, Esq. 'Report on the Suez Canal.' By Captain Richards and Lieut.-Colonel Clarke. Feb. 1870. Donor Captain Richards. 'Reisen in Ost-Afrika. By Baron C. C. von der Decken. 3rd vol. 1869. Purchased. 'Thermochemiske Undersogelser over Affinitetets, &c.' By Julius Thomsen. Kjobenhaven, 1870. Donor the author. 'Om Endringen af integraler af irrationale Differentialen, &c.' By Adolph Steen. Kjobenhaven, 1870. Donor the author.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF APRIL 11TH.—A Map of South Africa, showing the explorations of Dr. Livingstone from 1840 to 1869. A Map of Central Africa, showing the Explorations of Portuguese travellers and Dr. Livingstone. Chart of Nova Zembla, showing the track of Captain E. H. Johannesen in 1869. Presented by the author, Dr. A. Petermann.

The following papers were read:—

1. *Expedition to the Trans-Naryn Country in* 1867. By Baron P. R. OSTEN SACKEN. Translated from the Russian and communicated by E. DELMAR MORGAN, F.R.G.S.

[EXTRACTS.]

BARON OSTEN SACKEN arrived at Vernoye in the end of June, 1867, where he met Colonel (now General) Poltoratsky, who was preparing a reconnaissance to the Trans-Naryn district. Colonel Poltoratsky invited the Baron to join the expedition; and the latter, considering that so favourable an opportunity of exploring a country as yet unvisited by Russians should not be lost, determined on accepting the invitation; the proposed route lay across the Thian Shan almost in a meridional direction south. The narrative is in the Baron's own words.

"The Trans-Naryn district, which we purposed visiting, became part of Russia's dominions by the Treaty of Pekin in 1860, by which treaty the frontier-line with China is fixed to the east of Lake Issik-kul, along the southern spurs of the Celestial Mountains, to the Kokand territory, and, therefore, includes within the Russian boundaries the whole of the mountainous district south of the Issik-kul. In this country are situated the head-waters of the Syr-Daria and the alpine lakes of Son-kul and Chatir-kul.

"On the 2nd July we left Vernoye by the road to Kastek.

"On the 6th and 7th July, the party crossed the Kastek Pass, which has been admirably described by M. Severtsoff. Along this defile the post-road between Vernoye and the Syr-Darian district runs. Here, too, a line of telegraph-wires to connect Russia with Turkistan is meditated. As we went through the pass we saw works in progress for making the road passable for wheel conveyances,—an operation attended by great difficulties, owing to the large quantity of boulders which obstruct the way, and the frequent windings of the little river Kastek, whose waters first strike one side, then the other, of the narrow defile. The work was being done by soldiers, and five wooden bridges were ready. The newly-planed hand-rails glistened in the sun, and our Kirghiz horses, startled at so unusual a sight, could hardly be forced across the bridges.

"The view from the summit of the Kastek Pass, the desolate grandeur of which is commented on by Severtsoff, also made a deep impression on us. We could distinguish particularly clearly the long snowy chain of the Alexandroffsky Mountains on the other side of the Chu Valley; these were the first of five ranges which lay across our route.

"On the 9th and 10th July our detachment crossed the Alexandroffsky range by the Shamsi defile, where, for the first time, we met with thick pine-forests.

"The descent from the Shamsi Pass into the valley of the Koshkar is far more abrupt than the ascent from the north. The valley of the Koshkar is still more dreary and monotonous in aspect than that of the Chu. After crossing this valley, we commenced ascending the Kizart, a tributary of the Koshkar, and then entered the belt of mountains on the northern slopes of the Son-kul plateau. We reached the lake of Son-kul on the morning of the 14th July. All the previous night we were forcing our way through defiles and over cliffs, in an ever upward direction, till at last, after climbing the last lofty axis of the range, we suddenly saw before us the blue surface of the lake, scarcely rippled by the morning breeze. From the eminence on which we were standing an inconsiderable distance of sloping-ground, covered with luxuriant grass, separated us from the lake. In our rear, *i.e.* to the north, the snowy peaks and ridges presented the appearance of a troubled sea. On the opposite (southern) side of the lake the hills separating the Son-kul plateau from the Naryn Valley were as one continuous chain, not much elevated above the lake, with peaks here and there speckled with snow. On the night of the 14th we encamped at the very edge of the lake, between two such ridges. The shores and bottom of the lake close to the shore are thickly covered with large pebbles, beyond which is a yellowish clay. I could not judge whether the depth of the lake increased suddenly. The taste of the water, though inferior to that of the rivulets, which force their way through the grass to the lake, is fit for use, and our cattle drank it eagerly. There are no large fish in the lake; in the pebbly bed of the lake, near the shore, a few small fish, about an inch long, were seen, and also crustaceous animals. We only saw one kind of bird on the lake, which the sportsman of our expedition pronounced to be widgeon.

"The Son-kul plateau is above the elevation of arboreal vegetation; it is admirably adapted for Kirghiz encampments. The extreme length of the lake is 25 versts (17 miles), extreme breadth, 18 (12 miles). The Koidjarti flows out of the south-east corner of the lake, and falls into the Naryn.

"On the 15th July we marched round the north-west end of the lake, and came to a level plain, which joins the lake on the west. The pasturage here is excellent, but we found it entirely deserted by the Kirghizes, who had retired to the mountains on hearing of our approach. Son-kul presented a very different appearance when we revisited it on our return in the month of August. Kirghiz

encampments were then everywhere scattered along its banks, and presented all the animation of nomad life. The commander of our expedition was received with due honour, fêtes (baigi), with horse-races, &c., were celebrated for the occasion. I never before witnessed such prosperity and wealth as we saw in the encampments of the Kirghizes on the Son-kul when we returned from our successful reconnaissance. The numerous clean white yurtas (felt tents) glistened in the sun, and afforded a marked and agreeable contrast to those we were in the habit of seeing on the Kirghiz steppe, where they are almost black, dirty, and smoke-stained.

"To return to the description of our journey. The detachment continued its march in a southerly direction, and soon the lake was hidden from view by the spurs of hills on its south-west side. We halted on entering the picturesque defile of Molda-asu, whose descent to the Naryn is wonderfully steep. Gigantic orange-coloured rocks of close-grained limestone marked the entrance to the defile, in which we first saw bushes of juniper, and, as we descended, graceful white pine-trees. The pine-forests grow in one continuous dark-green belt along the most inaccessible cliffs of the mountain sides, and render the scenery quite peculiar of its kind. From the nearest heights we obtained a splendid view over the valley of the Naryn, and the southern Naryn Range, beyond which could be seen the elevated table-land sloping towards the north, and forming part of the watershed of the Naryn. The distant view to the south was shut out by the snowy peaks, which seemed part of one great range, though, in reality, portions of a succession of ranges, of which fact we were afterwards convinced. But this great panorama was wanting in brightness—the colouring was monotonous and dreary, owing to the prevailing clay and grey limestone. Verdure could only be seen in the foreground close to the observer.

"We descended the Molda-asu defile with some difficulty. Vegetation here was plentiful. Besides the white pine and juniper mentioned above, there were varieties of leaf-bearing shrubs, wild rose, arbutus, currants, barberry, honeysuckle, dogberry, and mountain-ash, the greater number of which were already bearing fruit.

"The first half of the descent, and the most difficult, terminates in a deep valley, where a small stream from the right unites with the one in the defile, which here takes a sharp bend to the left (i.e. to the east), and widens out. The road becomes more even, and the stream of greater volume. We were more than an hour making the descent to the first bend of the defile, and three-quarters of an hour

to the second, when we came to another deep valley at the wood of Ike-chat.

"At 11 A.M. we were under the walls of Kurtka, an insignificant Khokan fortress, demolished in 1863 by Captain Protsenko, but since restored, as after that time no Russian forces had appeared on the Naryn. The garrison of the fort took to flight as we approached. It consisted only of 20 men, as we discovered from an interesting report to the Khan of Khokan, forgotten by the commander of the fort in his haste to run away. Kurtka stands on a lofty precipitous cliff, which is being undermined by the abrasion of the river, whose current is here very rapid. Kurtka had more the appearance of a heap of clay and dirt than the habitation of people accustomed to settled life—from a distance, indeed, it is difficult to distinguish it, for the colour of the habitations blends with the yellowish-grey tint of the clayey soil.

"On the evening of the same day a ford was discovered across the Naryn, where in its deepest part the water reached the saddle-girths. Here we crossed the following day (17th July); the river here is divided into several channels, its total breadth being from 200 to 300 yards.

"Our route on the other side of the Naryn lay through an unknown country. As far as Kurtka we had an excellent guide in Captain Protsenko's topographical map, but had now to trust to Kirghiz guides.

"On the 18th we continued our journey down the valley of the Naryn, after making our way through tall cane thickets (*Phragmites*).

"In an hour's time we came to the Terek, a tributary of the Naryn, whose banks were wooded with poplar. This was the last arboreal vegetation we saw till we reached the southern slopes of the Thian Shan, two days' march from Kashgar.

"We encamped for the night at the upper end of the valley, where it is more open at the foot of some clayey cupola-shaped eminences totally devoid of vegetation. Far to the south lay stretched before us a gigantic transverse chain of mountains, whose snowy peaks, at first hidden in the clouds, shone out before evening quite clearly. The slopes were covered with grass-land. In this chain we could distinguish the entrances to three passes leading to the valleys of the Atbasha and Arpa tributaries of the Naryn and running parallel to it. We were told they are respectively named (beginning at the easternmost), Airiiash, Beibitche, and Chalkudè. On the 19th July we came to an open plain forming a plateau somewhat inclined towards the north, and surrounded on all sides except on the north by low spurs, beyond which were the lofty mountains.

"On this drearily monotonous table-land our party had to encamp for the first time without water since their departure from Vernoye. We continued a south-westerly direction, and, after six hours' march, towards 3 P.M. we encamped for the night at the entrance to the defile of Djaman-daban.

"The Djaman-daban Pass takes two days' march to get through, as does that of Shamsi. The Djaman-daban chain is therefore quite as important as the Alexandroffsky. We have no knowledge of the chain further to the west; towards the east it very soon diminishes in size as it approaches the Naryn.

"The entrance to the Djaman-daban Pass is very conspicuous from a distance, owing to the bright red rocks of ferruginous conglomerate, which forms a distinct stratum. This was the wildest and most dreary defile which we crossed during our expedition. The rocks are for the most part of a gloomy grey colour. The ascent at first is very gradual; about the fourth mile up the pass there were bushes of juniper, but white pine does not grow in this defile.

"The altitude of the Djaman-daban Pass was not ascertained by barometrical observation, though I conclude that it is not lower than the Tashrobat Pass, which is 12,900 feet above sea-level according to Buniakoffsky. On the top of the pass the cold was intense, and snow fell. Our caravan was so exhausted that we determined on halting upon the slope of the mountain before entering the valley of the Arpa. We pitched our camp on some level ground which terminates in a rocky precipice. From here we had an extensive view over the valley of the Arpa, which is undoubtedly at a considerable elevation. On the opposite side of the valley stretched the great chain of Kashgar-daban, on which I counted 63 snowy peaks.

"The Kashgar-daban Chain visibly decreases from west to east. As we descended the Djaman-daban we could see the great size of the Kashgar-daban Chain on the west, with enormous snow-fields between the peaks. Further eastward, though not so far as the Súuk cleft, forming the pass of that name, there seemed much less snow. To the east of Súuk, opposite the rivulet Djamat (where we passed the night of the 23rd on our way to Tashrobat), the snow again increases in quantity, though I should consider that the Kashgar-daban Chain is not so stupendous here as in its western part. One of our companions, Chaldeyeff, Captain of Cossacks, visited the Súuk Pass. According to his opinion, this pass is considerably higher than that of Djaman-daban. The Cossacks and Khirghizes, who accompanied him, suffered much inconvenience from the rarity

of the atmosphere, and he himself, for the first time during the whole expedition, experienced difficulty in breathing. However, Buniakoffsky, who visited the Sûuk Pass in 1868, ascertained the altitude, according to his observations, to be 12,740 feet, *i.e.* about 200 feet lower than Tashrobat.

"On resuming our march we descended to the valley of the Arpa, turned to the east, *i.e.* up the valley, and crossed the barely-perceptible watershed separating the Arpa from another tributary of the Naryn, the Atbasha. On the 24th July we were at the entrance to the Tashrobat defile, which serves as a pass across the snowy chain, extending from the east and terminating abruptly at the head of the Arpa valley. A road, frequently used by the caravans going to Kashgar, passes through the Tashrobat defile; the caravans cross either by the latter route, or by the Terekti Pass, more to the east.*

"We crossed the Tashrobat Pass in one march, *i.e.* six to seven hours. The last part of the pass is very steep. From the summit the eastern extremity of the Chatir-kul was visible; the descent to the lake is much shorter than the ascent from the north side. The height of the lake, according to Buniakoffsky's observations, is 11,050 feet, *i.e.* 1850 feet below the Tashrobat Pass.

"We suffered a great deal from the cold in the Chatir-kul plateau; large flakes of snow fell at intervals. The following morning we found ice in our cooking-utensils. We had no wood fuel, and in damp weather *kiziak* burns badly; we were forced to burn pieces of old felt tents, &c., to cook by.

"On the 26th July, in alternate sunshine and snowfall, our party passed round the east side of Chatir-kul, over level ground covered with saline grass, which further to the east joins the Aksai table-land. On our return journey we completed the circuit of the lake: in shape it somewhat resembles the Issik-kul; its length is 21 versts† (14 miles), breadth 9½ versts (6 miles). The snowy mountains are 6 to 10 versts (about 5 miles) distant from the lake on the south side. These mountains are a continuation of the Kashgar Daban, which we had seen in the valley of the Arpa. At this point the chain is somewhat smaller. The mountains approach close to the lake only on its western side. The streams which join the lake are probably dry all the year round, except in spring, during the excessive melting of the snows. A rivulet which issues from the Tashrobat Pass dries up before reaching the lake. The water in the lake

* Valikanoff went to Kashgar by the Terekti Pass, and returned by that of Tashrobat.

† The Issik-kul is 169 versts (113 miles) long.

is brackish; the depth cannot be very considerable, for we could see shallow places a mile from the east shore, as we stood on the mountain south of the lake.

"The Chatir-kul has no outlet; but I think it important, for the sake of future travellers, to mention the following facts, which may be worthy of their investigation:—As we rode over the plateau which joins the lake on its eastern side, we crossed a small brook or ditch, about 10 feet wide, which joins the Chatir-kul, and has a direction from east to west. There was apparently no current in this brook. Our topographer, in surveying, went considerably more to the east, and found that this brook finishes in a sedgy marsh, about 6 miles from the lake. From this marsh a small stream flows to the eastward, which he was told was the Aksai, but which, on further investigation, proved to have no connection with that river; for he found that it turned to the north, and at length lost itself in one of the dry channels which return again to the Chatir-kul. The real Aksai has its source further to the east, about 13 miles (20 versts) from the lake.

"Judging from the grass (*Batrachium* and *Potamogeton pectinatus*) left by the receding waters of the lake—in some places on the east shore at a distance of 20 paces from the water's edge—I should say that the lake rises 1½ foot, and probably a great deal more when the snows melt. At the west end of the lake there were traces of submersion of the shores for a distance of 200 yards from the lake.

"Chatir-kul is on the borders of Russia and Eastern Turkistan: the object of our journey was therefore attained. The commander of our expedition, however, very justly remarked that his survey would be far more valuable if it could be continued to some well-known and important point. Kashgar was well suited for our purpose, and, according to the march-routes of the caravans, was only 5 marches distant from Chatir-kul. We had no intention of going as far as Kashgar itself, but we thought that if we could cross the mountains in front of us we should see that city, even though at a distance from it, for we believed it to lie in an open plain like Strasburg, when seen from the heights of Schwartzwald or Berne, from Mount Niesen, on the Lake of Thun. But we were wrong in our conjectures, for after three forced marches to the south we found ourselves still among the mountains, which, though lower, gave us no view of Kashgar.

"Seventeen versts (11 miles) from the eastern extremity of Chatir-kul is the pass of Turugat, forming the watershed at no great elevation above the lake. The streams running to the south unite with the small river Toyanda part of the basin of the Kashgar-daria,

Eastern Turkistan. A sloping defile, in which is the dry channel of a mountain torrent, leads to the Turagat Pass. The bed of this dried water-course is not covered with the shingle generally found in these mountain torrents, but with a red clayey sand. We met with several such water-courses during our excursion in an easterly direction from Turagat, where we saw numbers of small hillocks, between which the aforesaid dry water-courses of red sand wind. The whole district has a peculiar character. Judging from the appearance of the cliffs and sandstone rocks which form the sides of these water-courses, one is led to infer that in spring, when the snows melt, the quantity of water in them is very considerable.

"We rode more than once along the channels of these dried-up streams, whose beds form admirable bridle-paths, and found on the soft damp sand innumerable traces of animal life. M. Skorniakoff, our naturalist and sportsman, showed us tracks of bear, wolves, deer, mountain-sheep, and hares.

"On the 29th July we continued our journey south from the Turagat Pass. At first we descended the valley of the Toyanda Rivulet, bounded by low hills, and flowing almost due south. There are no steep descents, and the ground slopes gradually. The following day, 30th July, we finally entered the zone of shrubs; the banks of the stream were covered with tamarisk, *Lycium*, &c.

"About midday we came to the junction of the Toyanda with the Súúk; the latter flows from the west, and probably has its source in the Súúk Pass, in the Kashgar-daban. We this day overtook a small caravan on its way to Kashgar with sheep.

"The 31st July was our last day's advance. After two hours' ride we saw the first tree, a poplar; it is first met with singly, then in groups mingled with willow. A little farther on it became apparent we were approaching an inhabited country. There were fields of excellent wheat, and people, who did not seem at all disturbed by our appearance, quietly engaged in agricultural labours. They called themselves Chonbogishi.

"At a bend of the valley to the south-east we had a view of a small fort or outpost situated on some elevated open ground. This was the outpost of Tessik-tash, where the Chinese authorities met Valikhanoff in 1858.

"Tessik-tash was the Ultima Thule of our expedition.

"According to the Kirghizes we were 12 versts (8 miles) from Artush, and 30 versts (20 miles) from Kashgar. These distances are only approximate. In any case, it was interesting to know that Kashgar is situated to the east of where we were. This fact determined Poltoratsky, in reading a paper before the Physical Section

of the Geographical Society, to lay down the longitude of Kashgar two degrees east of that assigned by the Jesuits; a statement, however, made by him with some reserve, because all surveys south of the Issik-kul were based on the only astronomical point fixed, viz., the western extremity of the Issik-kul.

"Certainly, if we take into consideration Captain Reinthal's map, made at the end of 1868, of the road from Fort Naryn through the Terekti Pass to Kashgar, the position of the latter town would be again west of that assigned to it by our survey. In Walker's map of Central Asia (1867) Kashgar stands on the 75° 25' longitude east of Greenwich, *i.e.* 1½ degree further east than Klaproth's map, and this is based on Montgomery's calculations (see Vol. xxxvi. 'Journal London Geographical Society'). With regard to the astrononomical positions fixed by the brothers Schlagintweit, who assigned the positions of Kashgar, and all the towns of Eastern Turkistan, two degrees further to the west than those laid down by the Jesuits (an opposition to which was first made by the Russian Society in 1861 by the late Captain Golubieff, Fellow of the Society), we must exclude them altogether from the cartography of Central Asia.

"We have only to hope that the position of Kashgar may be finally determined as soon as possible, by sending an astronomical expedition there."

The Paper will be printed entire in the 'Journal.'

The PRESIDENT, in returning thanks to the Baron Osten Sacken, the author of this most instructive paper, said that the Council of the Society had that day elected him an Honorary Corresponding Member. He regarded it as the duty of Englishmen and Russians to act harmoniously in the great work of exploring, each from their own side, the physical structure of Central Asia.

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2. *Progress of Russian Explorations in Turkistan.* By DELMAR MORGAN, Esq.

[EXTRACTS.]

The new administrative reform which has created the province of Turkistan under the independent rule of a General Governor, and new and carefully executed maps made in conformity with the latest surveys and observations conducted by Professor Struve and others, together with improved means of communication, and a more settled state of the country will, let us now hope, throw open a country which has hitherto been a *terra incognita* to Europeans.

This province is bordered by Djungaria and Southern Siberia on the east, Eastern Turkistan or Kashgaria, the Khanats of Bokhara

and Kokan on the south, Khiva and the Aral Sea on the south-west and west, and the Khirghiz Steppes and Western Siberia on the north and north-east.

Commencing at the 47th parallel north latitude, the Russian frontier line with Western China was fixed by the Treaty of Pekin, in 1860, and the protocol of Chuguchak in 1864, from the Tarbagatai range in an almost meridional direction south, to about the 43rd parallel north latitude, where it turns to the west and skirts the southern slopes of the Thian Shan Mountains, as far as the Kokan possessions. But owing to the Dungan insurrection in the districts of Chuguchak and Kuldja, Chinese authority in those parts no longer exists, and Eastern Turkistan is under the dominion of Yakoob Beg; therefore this portion of Russia's dominions is not well defined.

The boundary line, too, with the khanats of Kokan, Bokhara, and Khiva, is likewise not finally determined upon, so that along the whole distance from the Naryn to the Sea of Aral, the frontier line is only well marked in one place, viz., where it crosses the Syr Daria in the thickly-populated district between the town of Kokan on the one side, and Tashkend and Chodjend on the other.

The province or General-Governorship of Turkistan thus includes nearly the whole of the basin of the Syr Daria, the basin of the Naryn, the lakes Balkash, Issik-kul, Chatir-kul, &c.

In conformity with its hydrographical features, Turkistan is divided into two districts, viz., the Syr Darian on the west, from the river of that name, with Tashkend for its chief town, and the Semirechinsk—which means seven rivers, from the seven rivers falling into Lake Balkash—on the east, with Vernoye for its chief town.

The successes of the Russian arms were so great in 1868, and the advance of her army so rapid, that a new military district of Zeravshan (so called from the river of that name) was formed with the towns of Samarcand and Katti Kurgan, taken from Bokhara, and this district is now undergoing reconstruction, though recent reports allege the evacuation by Russia of this advanced line of occupation. I may add that the reports alluded to require confirmation.

The object of this paper being to draw the attention of this Society to the results of recent Russian explorations in Turkistan, I would briefly mention the names of some of the more remarkable explorers, whose labours are recorded in the Russian language in the Proceedings of the Imperial Geographical Society.

I will commence my list with *Khanikoff*, the Orientalist, and

Lehmann, the botanist, who visited Samarcand in 1841. *Veniukoff*, who took observations in the valley of the Chu. *Semenoff*, the pioneer of Thian-Shan explorers. The late Admiral *Butakoff*, whose labours in connection with the Aral Sea gained for him the gold medal of this Society. More recently *Poltoratsky*, who has explored the great glacier of Mussart in the Eastern Thian Shan. *Severtzoff*, whose explorations south of the Issik-kul, in the valleys of the Naryn, Athasha and Aksai have enabled him to arrive at interesting conclusions respecting the analogy between the fauna of Turkistan and that of the Himalayas. *Osten Sacken*, whose interesting paper has just been read, and whose botanical studies illustrate the further analogy in the flora of these two great ranges. *Valikhanoff*, who made his way to Kashgar with a trading caravan, and many others. I should mention the labours of Messrs. *Buniakoffsky* and *Reinthal*, who in 1868 made barometrical observations across the entire range of the Thian Shan; the latter reached Kashgar and ascertained the height of that place to be 4017 feet above sea-level, which, with Johnson's observations at Ilchi and Hayward's at Yarkand, enable us to place the average height of the plateau of Eastern Turkistan at 4000 feet above the sea-level.

I might mention the names of many other Russian explorers whose labours are on record, but the list I have detailed above will suffice to show that Russia has not been standing still in the path of scientific research in Turkistan. But though much has already been done, a large tract of country in Central Asia is still unexplored. The Upper Zerafshan Valley, for a space of 180 miles, has as yet been unvisited by scientific travellers; we know but little of the Syrt, or table-land south of Issik-kul, except that it is a bare steppe-like plateau above the limits of arboreal vegetation, and the Eastern Thian Shan is also very imperfectly known.

As an instance of the valuable and interesting results of Russian explorations in Turkistan, which are almost daily coming to light, I may quote the following passage from the account of the proceedings of the Imperial Russian Geographical Society, as recorded in the 'Journal de St. Petersburg,' so recently as last Saturday week, the 16th April:—

"M. Henri Moser has placed at the disposal of the Geographical Society three Arab manuscripts, which he has brought with him from his travels in Turkistan. These three manuscripts have been examined by Mons. P. I. Lerch, a competent authority, who after having devoted due attention to the matter, finds that the manuscripts in question contain the history written by Tabaris (who died in the year 922 or 923 after Christ) from the creation of the world to the time of the Sultan Houssein-Mirza. The second manuscript contains a history by Mavvrenagar and Khorassan, from Tamarlane down to

the year 1646 of the Christian era, while the third manuscript, which is remarkable for the elegance of its binding, contains 'The Golden Chain' of the celebrated Port Djamh."

Although it is true that some copies of these manuscripts already exist in the Public Library of St. Petersburg, and in that of the Asiatic Museum of the Imperial Academy of Sciences, nevertheless those recently found form a valuable acquisition, and we cannot sufficiently thank M. Moser for the zeal with which he has pursued his search for Oriental manuscripts during his sojourn in the towns of Russian Turkistan.

The Paper will be printed entire in the 'Journal.'

The CHAIRMAN, on behalf of the Society, thanked Mr. Morgan both for the *resumé* of Russian explorations he had just given, and for his admirable translation of Baron Osten Sacken's paper.

M. BARTHOLOMEI, who spoke in French, said that his *rôle* on the present occasion was a most pleasant and easy one: it was to thank the Society and its illustrious President for the courteous and friendly expressions that had been used in speaking of the country to which he (the speaker) had the honour to belong. He had also to thank them, in the name of the Baron Osten Sacken, Secretary to the Imperial Geographical Society, for the distinguished favour they had done him in electing him Honorary Corresponding Member of their body. He did this with the greater pleasure, inasmuch as the Baron Osten Sacken was an old colleague and friend of his. Such encouragement, given by an eminent body like the Royal Geographical Society of London to one of the recent explorers of Central Asia, was of great importance, as testifying to the peaceful character of that rivalry in exploring unknown and barbarous lands—a rivalry in which the fruits of victory will be gathered by science and civilization.

Sir H. RAWLINSON said that every one who had listened to Mr. Morgan's paper and had been previously accustomed to trace the steps of British travellers in Central Asia, must have been struck with the singular parallelism between the Russian and English proceedings. As Baron Osten Sacken and his party had traversed five successive chains of the Thian Shan in crossing from Siberia to the Kashgar frontier, so our travellers, Messrs. Shaw and Hayward, had surmounted five different ranges in their journey across the Himalayan plateau between India and Turkistan. To whichever party might be adjudged the honour of first determining the position of Kashgar—whether to the Russians, Baron Osten Sacken, who had approached, or Lieutenant Reinthal, who had actually reached the city, or to the Englishmen, Hayward and Shaw, who had alone succeeded in taking astronomical observations on the spot—he was sure no unworthy jealousy would be shown by the other side. They were all working for the same end, the illustration of the geography of Central Asia, and although naturally animated with a mutual spirit of emulation, were quite prepared to offer congratulations wherever success was achieved. In this view English geographers had seen with much interest and satisfaction an account of three expeditions which had been lately organized by the Russian Government, and of which proceedings were reported in a recent number of the 'Journal de St. Pétersbourg.' The first expedition had discovered the sources of the Naryn in a glacier under the peak of the Tengri Dagh, near the Muz-art Pass, and had subsequently followed down the course of the river to the point where Baron Osten Sacken had passed it, immediately contiguous to the Kokand frontier. A second expedition had been sent into the desert, north of Jezzakh

and Uratoppeh, in order to ascertain whether there was not a practicable line by which direct communication might be established between Tashkend and Samarcand, instead of making the détour by Khojend. The direct line, it was stated, had been favourably reported on, provided that Artesian wells could be sunk in the desert, and a Russian officer, who had studied under the French in Algeria, was about to be employed on this duty. (In connexion with this second expedition, Sir Henry also alluded to another surveying party which had explored the northern skirts of the Noora-Táú Range from the neighbourhood of the proposed Tashkend-Samarcand line across the desert, as far westward as the great caravan route from Bokhara to Carala.) The third expedition, of which a published account had that evening been placed on the Society's table by Mr. R. Michell, related to the valley of the Zerafshan River eastward of Samarcand. This valley had been explored by Mons. Fedchenko as far up as the vicinity of the Iskender-Kul Lake, distant 150 miles from Samarcand, and some interesting geographical discoveries had resulted from the journey. These various reports showed with what assiduity the Russians were pushing geographical research, and also bore testimony to the frank and honourable manner in which they placed the results of their explorations before the world with the least possible delay. He might also draw attention to a statement in a recent Russian paper that Mons. Khludoff, the well-known merchant of Tashkend, had in the course of the past year crossed from Kokand to Afghanistan on commercial business. If that were true, Mons. Khludoff had anticipated Mr. Hayward's exploration of the Pamir, for he must have travelled by one of the routes followed by our agent, Abdul Mejéd, in 1864, and was the first European who had ever crossed direct from the Jaxartes to the Oxus. The Russians and English would continue to work, he hoped, as co-labourers in the field of geographical science, agreeing in this, that it was most desirable, in the interests of peace and commerce, to encourage explorations in the countries intervening between their respective territories by all legitimate means.

Mr. R. Michell observed that an expedition to the Usuri was being organized, which most probably would produce valuable results. No list of the names of Russian labourers in the Central Asiatic field was, he said, complete which omitted those of Chernayef and Grigorief. Last year Mr. Fedchenko explored the valley of the Zerafshan from Samarcand to beyond the point reached by Lehmann, and had almost solved the mystery connected with the existence and position of the Iskander-kul, which has puzzled geographers for many years. He had discovered that the Zerafshan did not flow out of that lake, but that its tributary, the Fan River, issued from it. Mr. Michell suspected that there was a communication from Bokhara into Kashgaria, across the so-called Belur-Tagh Mountains. He had that evening received a letter from Mr. Fedchenko, who was about to set out again from Moscow with the object of discovering the sources of the Zerafshan, and laid on the table an account of Mr. Fedchenko's recent explorations, which he had been requested by that gentleman to present in his name to the Royal Geographical Society. The translation of this paper he would be happy to undertake upon himself. He fully recognised the merits of Baron Osten Sacken's paper, and with reference to the one drawn up by Mr. Morgan, rejoiced that the latter had brought his talents into a field in which they were now so much required, and that he had at once recognised the wise maxim—

> "Scire tuum nihil est,
> Nisi te scire hoc sciat alter."

Mr. Saunders said the route between Kashgar and Kokand by way of the Terek Pass had long been known to geographers, but it had been regarded as almost west of Kashgar. Now, however, it appeared that there was a Terek Pass north of Kashgar. Were these two different places, or had there been an

error in placing the Terek to the west? The nature of the communication between Bokhara and Kashgar, by way of the Zerafshan, was shown by the fact that Lehtmann had to leave his wheeled vehicles at Penjkent and take to mules, because the Zerafshan flowed through a deep gorge, along the cliffs of which the party advanced for some distance, and at length the communication had to be continued along a wooden platform, supported by trunks of trees driven into the clefts of the rocks. He wished to know upon what grounds Mr. Morgan stated that Kokand and Bokhara had been incorporated into the Russian empire. For a long time England had participated in the trade passing through Bokhara and Kokand to Central Asia, and if the Russian empire was extended beyond the north bank of the Jaxartes, the Russian tariff would interfere with that trade.

Mr. MORGAN said he had merely stated that parts of Kokand and Bokhara had been incorporated into the province of Turkistan, which included parts of the government of Orenberg and Western Siberia. In 1868 the Russian forces moved further south, and the provisional military district of Zerafshan was formed.

Twelfth Meeting, 9th May, 1870.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Robert W. Dibdin, Esq.; Charles Dibdin, Esq.*

ELECTIONS.—*William Henry Bishop, Esq.; Sir Bruce Chichester, Bart.; Charles Dibdin, Esq.; Robert W. Dibdin, Esq.; Claude Erskine, Esq.* (BOMB. CIV. SERV.); *Capt. Thomas A. J. Harrison*, R.A.; *Campbell Hepworth, Esq.; Charles E. Lamplough, Esq.; F. J. Palmer, Esq.*, R.N.; *Edward Shearme, Esq.; Raymond West, Esq.; Capt. T. P. Wood.*

ACCESSIONS TO THE LIBRARY FROM 25TH APRIL TO 9TH MAY.—'Reise in Ost Afrika.' By C. Claus von der Decken. 4th vol. Heidelberg and Leipzig, 1870. By purchase. 'Journey to the Capital of the Western Mandingoes, West Africa.' By Benjamin Anderson. New York, 1870. Donor the President. 'The Primeval Monuments of Peru, compared with those in other Parts of the World.' By E. G. Squier. Donor the author. 'Correspondence of Sir John Sinclair.' 2 vols. 1831. Donor S. M. Drach, Esq. 'The Yosemite Guide-Book, 1869.' Cambridge, U.S., 1869. Purchased. 'Reise in Tropischen Amerika.' By Moritz Wagner. Stuttgart, 1870. By purchase. 'Geological Report of the Exploration of the Yellow Stone and Missouri Rivers.' By Dr. F. V. Hayden. 1859-60. Donor the author.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF APRIL 25TH.—Maps and Charts of Norway, on 34 sheets, including the Coast-Survey from Kristiansand to Bergen. Presented by the Norwegian Government. Two sheets of the Topographical Survey of

Sweden, viz., Borås and Huseby (in duplicate). Presented by the Royal Swedish Topographical Corps, through Major-General J. A. Hazelius, Chief of the Topographical Corps.

The following Papers were read:—

1. *Special Mission up the Yang-tsze-Kiang.* By R. SWINHOE, F.R.G.S., H.M. Consul, Taiwan.

[EXTRACTS.]

I WAS employed last spring on a special mission of inquiry into the trade of the River Yang-tsze. On the close of the mission I forwarded a series of Reports to the Government, through H.M. Minister at Peking. A printed copy of these Reports has been communicated by the Foreign Office to this Society; and at the request of our President, Sir Roderick Murchison, I have attempted to reduce and modify them into the following Paper, which, I trust, will be acceptable to this Society.

I embarked on board H.M.S. *Salamis* on the 8th March, and she left Shanghae the same morning. We visited on our way Chin-kiang, Nanking, and Woo-hoo, and arrived at Kiu-kiang on the 14th March. At Kiu-kiang we waited the arrival of the next steamer from Shanghae, which was to tow up the little steamer *Faust*. Messrs. Michie and Francis, the delegates of the Chamber of Commerce, were before us at Kiu-kiang, and passed on by the passenger-packet.

The two surveying officers, Messrs. L. S. Dawson and F. J. Palmer, ordered to accompany us, arrived at Hankow, and the Admiral determined to take our party up himself in H.M.S. *Salamis* as far as she could go, when he would transfer us to H.M. gunboat *Opossum*, which he had specially detached and sent on in advance for this exploration service.

On the 23rd the *Salamis* started with our party, having the small steamer *Faust* in tow. There is an Admiralty chart of the river as far as Yo-chow-foo, at the mouth of the Tung-ting Lake, so we had no difficulty on the road to that city, which we reached at 2 P.M. on the 26th. A crowd assembled on the bank below the town, and the surveying officers, landing in the midst of it with their instruments to take sights, got rudely jostled and pelted by the mob. The people of Honan Province have long professed a hostile spirit towards foreigners. At the Admiral's desire, I called on the officer commanding the guardboat, who was entertaining some friends, and brought him to see the Admiral. He made profuse apologies, and offered to send to the prefect of the city for a guard to protect

us if we wished to go on shore again. The Admiral was very anxious to get away, and all that could be done farther was to address a hurried note to the prefect, quoting the treaty and complaining of the outrage. We left the city, and anchored at dark off King-ho-kow, the mouth of the Upper Yang-tsze. We travelled on nearly to She-show-hien, where the water shallowed, and the pilot told the Admiral it was unsafe for the *Salamis* to attempt to advance any farther. The gunboat was anchored not far above us round the bend, and the Admiral sent our party in the *Faust* to join her. This was on the 1st of April. On the 3rd the *Opossum* reached the large mart of Shasze, where we stayed till the afternoon of the 5th, prosecuting our inquiries on its trade, &c. On the 9th we anchored off Ichang. Above this the river contracts, and runs through a series of gorges with rocky bottom, forming in places rapids and whirlpools. The Chinese pilot engaged at Hankow refused to take the gunboat any higher, and, of course, her commander, Lieutenant J. E. Stokes, naturally objected to attempt unknown waters against the pilot's warnings. We knew before that the river was navigable as far as Ichang, though the *Opossum* was the first vessel that had attempted it. But it was the rapids that we wanted the surveyors to examine and give an opinion on. We accordingly sent to engage a native boat to take us as far as Kwei-foo, the first prefectural city in Szchuen, situated just beyond the series of gorges and worst rapids. Passenger-boats were, at the time, somewhat scarce, and there was such small difference between their charge for taking us to Kwei-foo and that for advancing all the distance to Chung-king that we thought it as well to engage one to Chung-king, in case we might find it necessary to push on so far. The captain of the boat required some days' preparation; so, not to lose time, Commander Stokes, the delegates, and I made a cruise in the *Faust* through the first, or "Ichang gorge" (Hing Kwan Hea), and moored at the foot of a village called Nanto, on the left bank, within a few miles of the Woo-e-tan, or first rapid. The surveyors remained behind to complete their survey of Ichang. A local pilot that we had engaged was afraid to venture the *Faust* over the rapid, so we returned to Ichang the next day. On our way back we passed several large Szchuen boats, with their large crews of rowers pulling downstream. The *Faust* steamed past them with ease.

The Szchuen boat was ready by the 15th April, and we at once embarked in her for the up-river voyage. Our party consisted of Lieutenant and Commander Stokes, with two of his crew, Messrs. Dawson and Palmer, Messrs. Michie and Francis, and myself. Our boat was a Szchuen passenger or Kwa-tsze boat, with a crew of

forty-five all told, and had in company a Kwa-tsze, or sampan, to carry the trackers from one tow-path to another, and to serve at night as a sleeping-place for a good many of them. We started in the afternoon of the 15th. It is needless here to describe the slow and painful mode of tracking, the difficulties the boats encounter at each rapid, or, in fact, any of the details of this kind of travelling. We found our experience an almost exact repetition of what Captain Blakiston underwent, and has so well described in his work on the Yang-tsze. We passed the cities of Kwei-chow and Patung-hien (the latter a city without a wall) in Hoopeh, and Woo-shan-hien, in Szchuen, and at length reached Kwei-foo, the barrier city, at which all boats are examined on their way up and down the river. Before arriving at this town the surveyors gave an unfavourable opinion on the rapids; but I thought their experience should extend to Kwei-foo before it should be accepted as decisive. They were very industrious in making a careful sketch-survey so far, and took every opportunity of getting observations and fixing points, and Mr. Palmer made some truthful sketches of many of the most interesting spots on this enchanting portion of the river. Mr. Dawson, who was the senior officer of the two, represented that, as their opinion was against the navigability of the river for steamers until a thorough and separate survey of each rapid should be made, which would be a work of time, it was useless continuing their sketch-survey any farther, when they might be doing more serviceable work at Ichang and downwards towards Hankow. I agreed with him, and he resolved to return with Mr. Palmer. Lieutenant and Commander Stokes had also accomplished all he wished to do, viz., to form an opinion of the rapids, and he also made up his mind to return with his two men. With the delegates and myself it was different. We had heard the adverse opinion expressed on the navigation above Ichang by the naval officers, and their doubts as to whether steamers could ever make use of the water-way between Ichang and Chung-king; but Chung-king was reported to be the great mart of Eastern Szchuen, and it was very desirable that we should, by personal observation, confirm this. At Ichang, just as we were starting in the junk for the upper waters, I had received a despatch from Peking, ordering, for special reasons, the return of the expedition; and the only consideration with me was, whether I should be acting against the Minister's wishes by progressing further. H.M. Minister objected to the gunboat advancing, for fear the Chinese should misinterpret our intentions and imagine that we were going to assist the French missionaries in their quarrels about their Christian converts. The gunboat was safely anchored below Ichang,

and the party proceeding comprised only three foreigners with Chinese attendants. We had received two visits from M. Vincot, the Roman Catholic missionary resident at Kwei-foo, and he assured us that the disturbances had in no way extended to Chung-king, or to any part of our river-route. We sent the passes that Li-hung-chang, the Viceroy at Hankow, on the application of her Britannic Majesty's Consul at Hankow, had supplied Messrs. Michie and Francis, to the prefect, and, after taking a copy of them, he gave our boat a clearance, and made no objection to our proceeding. The Szchuen people were friendly and well-disposed, and we had every hope before us of a successful cruise. I, therefore, determined to carry on my investigations as far as Chung-king, and thence to return with all speed to Hankow. A month would be required to get to Chung-king and back to the gunboat, and I begged Lieutenant and Commander Stokes to return as soon as possible to Hankow, and leave us to find our way back by native means. This, however, Lieutenant and Commander Stokes declined to do, as he considered he would be acting against his instructions if he did not carry us safely back to Hankow. It was then agreed that we should make our journey to Chung-king and back to Ichang with as much speed as possible, and that the *Opossum* would remain at Ichang in readiness to carry us down to Hankow. A junk was hired at Kwei-foo to take the naval party back to the gunboat, and they left us on the 26th of April, and the same day we started in the original boat on our further voyage.

On the 28th of April we reached and passed Yun-yang-hien, and on the 30th arrived at Wan-hien. Here we moored close to three boats of the Prefect of Kia-ting-foo, who was on his way to Peking. This mandarin's brother, a merchant, called on us and no little surprised us by telling us that he had a cargo of white (insect) wax, which he was taking down on speculation to Shasze. He added, that as he travelled in the suite of a mandarin no questions were put, and his goods escaped duty. Thus, I presume, the mandarins pay expenses of travelling on service.

On the 1st of May we made a start, but before proceeding far the boat struck against a rock and made a hole, which required the greater part of the day to patch up. On the 4th we got to Chung-chow, and on the 6th passed Fung-too-hien. On the 8th we passed Foochow, on the 9th Chang-show-hien, and on the 12th we were at Chung-king-foo. We had already sent on the delegates' Chinese assistant (a Hankow man, and one that had visited and knew well the chief trading cities of Szchuen) in a small boat from Foochow to prepare quarters for our reception, and this man met us with

chairs at the landing-place, and we were soon installed in a big empty hong in the city. We expected to have a large excited crowd thronging our doors, but we were agreeably disappointed. People did come in some numbers, but there was no rudeness. It was necessary, however, to obtain some mandarin recognition, and I sent next morning my writer to the Hien (the Taoutae and Prefect were both away at the capital Ching-too-foo, together with the French Bishop of Chung-king, about the Roman Catholic troubles in Yew-yang-chow), with Li Hung-chang's pass, to explain the object of our visit, and to ask for a guard for our door. The Hien sent back a polite message to say that he had heard through the Prefect's office from the Prefect of Kwei-foo, announcing our passing that city with the intention of visiting Chung-king to make commercial inquiries. He took a copy of the pass, and at once sent a guard of five braves. With the help of these men our house was kept clear of all except those that were able and willing to give the information we sought; and with one or two of them following we were able to visit what part of the city we wished to see without molestation. The people were curious but not ill-behaved. They spoke of us as the "Yang-jin" (foreign man), and we very seldom heard the term "Yang-kwei-tze" (foreign devil). We received a visit from M. Favard, the Roman Catholic Procureur, the only Frenchman then in the city, and in returning the visit Mons. Faurie, the Bishop of Kwei-chow Province, was found at their mission with two missionaries, one from Yunnan, and the other from Kwei-chow Province. The Bishop was on his way to Rome to be present at the Œcumenical Council, but intended, *viâ* Shanghae, to go first to Peking. Many of the respectable native merchants, when they heard the object of our mission, called on us, and we busied ourselves nearly the whole time of our stay with collecting information on all matters connected with trade. The Chamber of Commerce had supplied Messrs. Michie and Francis with a bale of musters of foreign goods, and these we daily exhibited and heard opinions on. We also got specimens of all the various native goods that we thought would interest the Chamber of Commerce. Thus we occupied ourselves most thoroughly until the 19th of May, when, having arranged with the boat we came in to take us back, we again embarked and moved down three miles to a large temple, called Ta-fu-sze (or Monastery of the Great Buddha), and prepared to devote the whole of the next day to the study of the country, while our men were settling accounts in the city prior to returning. All boats upward-bound stop at this temple, and the sailors worship and give thanksgiving for safe voyage before a gilt giant idol seated on its shrine conspicuous in a building with open

front below the temple-wall, above high-water mark. The hills in this neighbourhood were dotted with hamlets and farms, and thoroughly cultivated. The great crop of the winter—opium—had been gathered, and rice, tobacco, cotton, maize, millet, ground-nuts, and runner beans, were now springing up in luxuriance. The people met us everywhere with smiles, and talked of us as simply "Yang-jin" or "Yang-tsze." No opprobrious epithets were heard from them, nor did they shout derisively at us.

On the 21st we left for our downward voyage, and passing rapidly over the ground which had been so tedious and laborious to ascend, in spite of the north wind, which blew pretty constantly against us, we reached Kwei-foo at 10 A.M. on the 25th of May.

Mr. L. S. Dawson, the Senior Surveyor, gave me, at Hankow, the following extract from his letter to his Commanding Officer, stating his views on the difficulties of navigation above Ichang:—

"The part of the river between Ichang and Kwei-foo was particularly examined, more especially in the vicinity of the rapids, and I regret to have to give it as my opinion that steam navigation cannot be carried on above Ichang. The force of current, want of anchoring-ground, intricacy of navigation, and changeable condition of the river's bed, are, I consider, sufficient reasons to preclude the possibility of anything beyond a native junk being able to ascend these rapids. The descent would be, if anything, more difficult, as should a vessel fail to answer her helm at the exact moment, nothing could prevent her being dashed upon the rocks.

"To make a proper survey of these rapids would be, I consider, at any time a matter of much danger, if not of sheer impossibility, as I found, on making the attempt in a boat with ten rowers, that she was altogether at the mercy of the current, and the chance of swamping or striking a rock more than probable: this was in April, and from what information could be gleaned from the natives the most favourable time. From the appearance of what would become the river's bed in summer (now some 30 feet dry) the rapids must increase in danger and violence, inasmuch that even junks have to tranship their cargoes. On the return journey by junk, a line of soundings was obtained mid-channel, the depth of water in the gorges and above Ichang generally was found to be above 20 fathoms, rocky bottom. In one gorge 44 fathoms was obtained. The various dangers are most abrupt, the lead giving no warning. No opportunity was lost of testing the speed of the current, although in the immediate vicinity of the rapids this had to be estimated, owing to the junk being tracked up close to the shore where the current's force was not so much felt. The river between Ichang and Yoh-chow is of a similar nature as below Hankow, and quite as navigable for vessels of 7 feet draught from the beginning of April to the end of September. Local report as to the fall of the river in these parts was so unsatisfactory, that although on the whole it tends to the conclusion that the river was in April at its lowest, still, unless I spoke from actual observation or better authority on the matter, I should feel much inclined to doubt this statement. This part of the river is subject to more changes than the river below Hankow, but nothing beyond what a pilot's experience could keep pace with. The general rule in navigating the river is to hug the steep bank, but the formation of the banks and difference of depth on either side of the ship, as shown by the lead, are also of great assistance. Plans of the river

in the vicinity of Ichang and Shasze have been made, on scales of 2 and 3¼ inches respectively."

Lieutenant and Commander Stokes, of H.M.'s gunboat *Opossum*, was also so kind as to favour me with his views, as expressed in his Report to the Admiral. I extract the following:—

"The great rise of water in the Upper Yang-tsze is, I suppose, caused by the melting of the snow on the mountains between China and Tibet. When the water is high it must be enormous in the gorges and confined portions of the river. I should certainly say that on the precipitous sides of the gorges the water must rise 60 to 80 feet, and I noticed the houses in the narrow parts were built very high up. We passed several rapids between Ichang and Kwei-chow-foo, and I consider in three of them the velocity of the current must have been 8 to 10 knots, very narrow, and appeared to be infested with rocks, with large boulders and rocks on both sides. I noticed most fearful eddies and whirlpools in the river also, before you came to and after you passed a rapid, which would, in case a vessel did not answer her helm at the very exact time, place her in a very critical position, and she would most likely be dashed to pieces against the numerous boulders and rocks that infest the river.

"It would not matter so much if the shore was of a mud nature, but being a place infested with large boulders on each side and very narrow channels, it would be a fearful risk for any steamer, and I would not like to cross these dangers in any ship that I commanded. It would not be so bad for a steamer proceeding up against the rapids, but the great difficulty would be in the downward course, on account of the velocity of the current. I inquired of several of the junk captains who trade up to Chung-king, if a vessel of my draught could cross: they all had the same opinion, that there was not sufficient water for her. I have been informed by some Chinese merchants at Ichang that several of the large junks are lost in crossing the rapids by striking on rocks. It is my opinion, from Ichang to Kwei-chow, the rapids are bad both during high and low water, and I should imagine they are worse during summer. I should think it would take nearly a year to survey them, and it would be a very perilous duty to perform. I did not observe any anchorage for a ship in the river; the junks, when they wish to stop, either make fast to rocks, or drive piles into the shore, and make fast their ropes to them. The river is exceedingly tortuous in some places, and the width about 80 to 100 yards."

The Paper will be printed *in extenso* in the 'Journal.'

The PRESIDENT, in returning the thanks of the meeting to the author of the paper, reminded the Society that Mr. Consul Swinhoe had formerly explored part of the island of Formosa, and read a paper on the subject, which is published in Vol. 34 of the 'Journal.' He had shown the capability of the River Yang-tsze for navigation as far as Ichang, and clearly shown the nature of the obstructions near that place, and had also pointed out the places where commerce might be carried on. The paper was an excellent addition to the information contained in the well-known work by Captain Blakiston.

Admiral COLLINSON wished to remind the President that Admiral Bethune was the first to lead vessels of the British navy into the Yang-tsze-kiang. Further explorations were afterwards undertaken by Admiral Sir H. Keliet, under whom he (Admiral Collinson) was second in command.

Admiral BETHUNE stated that it was his fortune to be employed to examine the entrance of the Yang-tsze some thirty years ago, with a view to ulterior operations, but his labours hardly came under the title of geographical research on the great river.

Mr. T. T. COOPER said he had travelled both on the lower and the upper

waters of the Yang-tsze, and considered the statements in the paper as to its non-navigability near Ichang fairly correct, but he believed the difficulties of passing the gorge of Ichang were not so great but that they might be surmounted by experienced persons in proper boats. The *Vixen*, which was employed to ascend the rapids, was about as unsuitable for the work as any boat of its size could be. He remembered seeing it trying to stem the current of a creek which was running about five knots an hour, and she utterly failed in the attempt. The removal of the obstacles which caused the rapids would require the exercise of considerable engineering skill, but still it was far from impracticable. In many places sunken rocks would have to be blasted, and in others jutting points would have to be cut down; but in these days, when trains traversed India and the Alps, the Yang-tsze-kiang might easily be rendered navigable. The most extraordinary feature with regard to the head-waters of the river was, that after passing Chung-king it opened out and became a fine moderately gentle stream of considerable depth. From that point up to one of its tributaries, the Min at Su-chow, it was quite navigable. He passed down from Kia-ting to Chung-king in the dry season and found six to eight feet of water the whole distance, and he slept during the time of descending the worst rapids. Just at the turn of the Yang-tsze above Su-chow it becomes utterly unnavigable, the water rushes down with a velocity almost incredible, and the gorge is incumbered with huge masses of boulders. Crossing the Kin-char-kiang about 200 miles to the north, he found it a deep, muddy stream, cut up at intervals by falls and rapids. He hoped that some day steamers might ply between the present open port of Hankow and Chung-king. Entrance would thus be gained into the very heart of the province of Sze Chuen.

Mr. George CAMPBELL asked if opium was freely cultivated in the upper parts of the river, without let or hindrance on the part of the Chinese government authorities, and how far the cultivation was likely to supersede the Indian supply.

Mr. COOPER said he had gleaned from the writings of Captain Blakiston that opium was grown, but he was not prepared for the enormous tracts which he had seen devoted to the cultivation in the provinces of Sze Chuen and Yun-nan. The result of his enquiries led him to infer that it had not interfered in the least with the demand for the Indian drug. The people on the Eastern sea-board complained that the Western grown opium was so weak, that to enable them to feel the same stimulating effects as those produced by the Indian drug they must smoke at least two-thirds more. He was therefore of opinion that the Sze Chuen and Yun-nan opium would only influence the Indian supply to the extent of adulteration. The heavy taxation laid on it would also assist in preventing the competition if the price of the Indian drug was kept down. It was not probable that there would ever be a sale for the Indian supply in Western China, as the people there could have their wants supplied more cheaply, and considered the foreign opium too strong.

Mr. G. CAMPBELL asked what was the nature of the taxation, and what sort of climate prevailed in the opium-growing parts.

Mr. COOPER said the province of Sze Chuen had a magnificent climate. There was no frost in winter in the central part, while the rains fell only in gentle showers just sufficient to keep a clothing of green throughout the year. In Yun-nan, however, the climate was different, and subject to the same kind of rains as prevailed in Assam. It was considerably warmer than Sze Chuen, and the rains, which were exceedingly heavy, commenced about the beginning of June and lasted till the middle of September.

Mr. W. LOCKHART regarded Mr. Swinhoe's report to the Chamber of Commerce as the most valuable document on the commerce of the river that had ever been made public. He, like every other traveller in China, had noticed

the coal-mines, and if the Chinese Government would permit some European merchants to work those mines with steam machinery a good supply could be obtained for our Indian steamers. The Japanese Government had already granted such a privilege to Europeans, who were working the mines with signal success. He hoped Mr. Cooper would renew his attempt to reach the head-waters of the Yang-tsze-kiang, and he believed the proper way to effect this was from India.

Admiral Sir W. HALL, who commanded the *Nemesis* during the Chinese war, claimed for Admiral Collinson and Admiral Kellet credit for surveying the lower part of the Yang-tsze-kiang up to Nankin. The result of their taking the British fleet up the river was an immediate desire on the part of the enemy for peace, to obtain which they not only agreed that, instead of the one port, Canton, five of their ports should be thrown open to our commerce, but that they would bear the entire expense of the war. It was a matter for deep regret that no advantage had yet been taken of the immense quantities of coal in China, which might be made available for our Indian steamers.

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2. *Route from Tientsin to Kiachta.* By W. A. WHYTE, F.R.G.S.

The journey I am going to give a brief description of, commenced at Tientsin, in the north of China, and ended at Kiachta, on the Russian-Siberian frontier. Our party consisted of two, Mr. Walcott, an American gentleman, and myself. I believe we are the first who have travelled over that portion of the globe during the winter months, also that the direction we took was more northerly, consequently shorter, than that generally taken by the few Russian officials and others who have passed through the Desert of Gobi.

We started from Tientsin at three o'clock on the afternoon of the 16th October, 1869. Our mode of travelling was in carts drawn by mules.

It is possible to go by water to within about 20 miles of Pekin, but it takes three or four days: whereas the land-transit is generally accomplished in forty-eight hours. We took with us two Chinese servants, who acted as interpreters, and were very useful to us on the way.

Pekin is now too well known for me to enter into any details about it. The impression, however, it left on my mind was, that it was, without exception, the most miserable, dirty, poverty-stricken town in China; and, when I say this, it means in the world.

I do not, of course, refer to a portion of Pekin which is called the Imperial City, as it is not open to the inspection of foreigners, and, from all one can judge from the exterior, it presents as grand an appearance as the Chinese city does a wretched one.

We left Pekin early on the 20th October, and continued for some time to skirt along the magnificent outer walls of the town, our direction being north-west. The road, as far as Yuen-ming-yuen, is

made of solid granite slabs, now, however, very much in decay. The Imperial hunting-grounds and the Summer Palace, which latter is now in ruins, we reached in a few hours, the distance from Pekin being 12 miles. Here the scenery improves very much, and continues to do so the whole way to Kalgan; but trees become very scarce, and, after a time, disappear entirely, as also do all signs of cultivation. Passing through the town of Nankow, our course being a little more westerly, we proceeded through the long pass, or, rather, defile of that name, its extent being about 13 miles. The scenery here was excessively grand; but the road—which may have deserved such a name centuries ago—was so rough, that it was a wonder to us how the mules managed to scramble over it in safety. When we reached the summit of the pass, 2400 feet over the sea-level, it well repaid us all we had gone through. The cold increased as we advanced, and the wind became intensely cutting, raising clouds of sand and stones. A curious thing that we noticed—which may be called a wall mania—was, that every town or village we passed through on leaving Pekin was walled round, and even isolated buildings were surrounded by sometimes as many as two and three walls, but all now more or less in decay; a word which would be a genuine motto for China, and all in it. After leaving the pass, our direction was more north. Passing over a very handsome old bridge, consisting of five arches, evidence of the previous existence of a large river, now only a small stream, we entered the town of Cha-tow, the best we had seen since leaving Pekin.

The inns all the way from Pekin—although very miserable and dirty, compared with the most ordinary buildings of the kind found in small villages in civilized parts of the world—are much better than those on the route from Tientsin. We were now proceeding on a table-land some 1700 feet over the sea-level, and, passing through the towns of Sha-chen and Chi-ming, we entered a wide valley, on the west side of which we could distinguish a long, lofty range of snow-clad mountains. We followed the right bank of the River Yungho, which runs through this valley for six or seven miles, going through a small pass cut out of the rock. We found amongst the rocky mountains which line the east side of the river, indications of coal, and we discovered a shaft, now in disuse. There were also abundant proofs of the whereabouts of copper and iron, and mining operations here would be, I should think, successful, if the Chinese Government could be induced to allow them; and probably gold would also be found there, as there is a range of hills not far off, called by the Chinese "Chock-Mun," or Golden Mountains, deriving their name, doubtless, from that precious metal having

been, at some distant period, found there. Here, for the first time, we came across long caravans of camels laden with brick-tea for Russia. We also saw large herds of very fine sheep; the animals having a peculiar tail, very short, and much prized by the Mongols, it consisting nearly entirely of fat. Leaving the river, we gradually ascended until we reached the town of Suan-hwa-foo, 2000 feet over the sea-level. On the 24th at 10 in the morning, we came to Chan-chia-kow, or more commonly called Kalgan, a Mongol word, which means entrance-gate, the distance from Pekin being 147 miles. It had taken us four days to do this journey. This town is the last one in China, and situated at the foot of the Kalgan Pass, where commences the great Desert of Gobi.

On entering Kalgan we were at once agreeably struck with the evident signs of prosperity we noticed. The streets, which are long and wide, were lined with shops, all roofed with a peculiar mud found in these regions, which becomes nearly as hard as stone, but not so hard as to prevent crops of grass growing on it, which gives a curious appearance to the town. They were crowded with strings of camels and oxen-carts, all laden with produce to or from Russia. Mongols, clad in divers-coloured clothes, riding on camels, were hurrying about here and there, looking after their caravans. After the quiet of the country, it was a scene of utter confusion to us, and we could imagine we were realizing a tale out of the 'Arabian Nights.' We remained jammed in the principal street for upwards of an hour, and my attention was much taken up by the swaying about of my litter, as it bumped against the passing camels and carts, and threatened every moment to capsize into the mud; but, at last, we got clear, by taking a détour and passing under a low gate in the walls, which obliged us to descend from our litters. We reached the suburbs, and, after a little trouble, found the residence of a Russian gentleman, to whom we had letters of introduction, and by whom, although we were perfect strangers, we were most kindly received and hospitably entertained during our stay there. It took us three days to complete the necessary arrangements for crossing the desert. We had to procure an outfit consisting of sheep-skin coats and boots, &c., stores and camels, and two old carts for shelter at night. Without the kind aid of our Russian hosts, who took no end of trouble in the matter, we might have remained there for weeks, as the Mongols are about the most difficult race of people to conclude a bargain with, and we had no knowledge of their language. The Mongols have a great respect for Russians. Their knowledge of geography is very limited; they believe that Mongolia is the centre of the world, bounded on one side by Russia, and

on the other by China; the existence of other nations is quite unknown to them, so it was important for us, if possible, to pass as Russians.

Everything being comfortably arranged for the long journey before us, and having dismissed our servants, who were not willing to go on with us, we started away again on the 26th.

The Kalgan Pass was a very rough one, and jolted my cart about sadly, jumbling all the contents, which I had arranged in a most scientific manner, into the centre, and putting me into a state of utter despair. We reached its summit, 6000 feet over the sea-level, at sunset, and a more glorious sight I have never seen—ranges upon ranges of mountains, some clad with snow, rising like ocean waves in utter confusion, stretched far away, as far as we could see; not a sign of verdure of any kind. We could trace the Great Wall skirting along the tops and sides of the mountains, with its gates and towers, making us wonder how ever the bricks and mortar got there; and as we stood contemplating the scene, with our two Lama guides, we were the only living beings in sight. For the moment we could not resist, as the sun gradually set and long shadows extended across the picture we were gazing upon, a feeling of desolation which crept over us, feeling so far away from all aid and so entirely at the mercy of our guides. However, the increasing cold making it necessary for us to move on, gave us a brisk walk, which soon dispelled our gloomy thoughts. We soon passed through a gap in the wall and found ourselves in Mongolia. The wall, which is now in ruins and some parts hardly traceable, is said by the Chinese to be 3000 miles in extent. It may be so with all its spurs. Darkness coming on, we mounted into our carts, and jogging away down hill over rocks and stones—a ride that will ever live in my memory—we reached the Desert of Gobi at one o'clock in the morning of the 27th October.

The temperature the whole way until we reached Kiachta was never higher than 24° Fahrenheit, and sometimes was as low as 30° below zero. The altitudes we passed over varied from 3400 to 6000 feet. After the first week vegetation entirely disappeared, and how our camels managed to exist was a marvel. Until we reached Tsagan Turgerik, 300 miles from Kalgan (lat. 45°, long. 104°), we hardly knew our whereabouts. This was the only place we saw after leaving Kalgan which we could designate a Mongol village. It consisted of a small white temple, from whence it takes its name, and a group of about ten yourts, which are a sort of round tent made of felt, lined with skins, consisting of one room, where all the family live together.

After leaving Tsagan Turgerik we passed over large plains of snow for two days, and then again over a sandy desert, and for three days had to get on as well as we could without water, as we could find none. The cold north-east winds, which at this season are prevalent, swept with a force beyond description over the plain. No amount of clothes would keep it out, and it found its way through the numberless cracks in our carts and rendered for the time our existence a burden to us. About the centre of this portion of the desert we passed through, we found large plains covered with most beautiful pebbles and very curious petrifactions—a clear evidence that this part of the globe must at some time have been under water.

The natives are strong sturdy Tartars; they live on horseback, tend their flocks of sheep and camels, pitch their tents when and where they choose, have no laws to obey, and no taxes to pay. They, of course, are Chinese subjects, but the Emperor would find it a difficult matter to enforce obedience amongst these children of the desert.

The women are generally good-looking, strongly built, and very healthy; but they dress during the winter months so like the men, that at any distance it is difficult to discern the difference. They have not the peculiar cast in the eye which the Chinese women have, but full dark ones, and rather high cheek-bones. They are very fond of finery, and wear quantities of glass beads in their hair and about their dress. I remember one morning riding up alone to a yourt to ask for milk. A very handsome Mongol woman came out and invited me in; her husband soon joined her, and I have never experienced so much genuine kindness as I did from them. When I rose to leave I gave the woman two small ten-cent. pieces, at which she testified the greatest delight, alternately holding them to her ears and then showing them to her husband, who, as a mark of his satisfaction, grinned incessantly. As she stood up—and a tall woman she was—her magnificent black hair fell down and nearly reached the ground, forming a picture, with her dusky flashing eyes and well-formed shape, that a painter would have envied and a poet dreamt of. When I bid adieu they both came out, the husband holding my pony as I mounted, and often as I looked behind I could see them still standing outside their yourt gazing after me. I dare say they wondered who the stranger was who could not understand their tongue, and could only converse in signs; and I have no doubt but that they often remember my visit as one of the most curious events in their simple life.

About 130 miles from Tsagan Turgerik we passed over some

remarkable-looking hills, which were decidedly volcanic; we also discovered lava, which would prove that volcanic action must have occurred here at some previous period. We encamped after passing these hills near a group of yourts; the inhabitants, numbering about twenty, came down in a body to stare at us. They seemed highly astonished to see us eat our soup with spoons—an excess of refinement unknown amongst them, their method being to dip a wooden saucer in the caldron and haul out lumps of meat with their fingers, swallowing them whole.

On the 12th November, 17 days from Kalgan, we distinguished at the end of a long valley the Chinese town of Mai-Mai-Chin, which is situated in front of the Mongol capital town of Kurin, called by the Russians Urga. This was, with the exception of Tsagan Turgerik, the first known town or village we had seen in the Desert. Beyond knowing a few Mongol words, we had been unable to converse with our Lamas, so, of course, our only resource was to place implicit confidence in them, which they well deserved.

We now came to the River Toll or Tula, which is a branch of the Selenga before it enters the Lake Baikal. We fully expected a serious delay here, as at times it becomes very much swollen and difficult to ford, and there are no ferry communications: however, we found it hard frozen, and crossed over without difficulty. We had been existing on very limited supplies of water for some time, so it may be imagined how pleased we were to be able to fill our bottles through the holes in the ice (lat. 48°, long. 106° 50'), although we were nearly frost-bitten by doing so.

Passing through Mai-Mai-Chin we arrived at the Russian Consulate, a fine large building situated between the two towns. There is no doubt but that the Russian frontier will be pushed on by little and little until it reaches Urga, and for this reason Russia keeps a Consular establishment there. Her interest already is much greater amongst the Mongols than the Chinese is. We were most kindly received by the Russian Vice-Consul, who was as pleased to see us as we were to see him, as beyond his guard of Cossacks, who are not composed of the most inviting-looking individuals, he seldom saw an European face.

Mongolia may be said to end at Urga virtually, and Siberia to commence, as the whole appearance of the country changes. Sandy plains disappear, and make way for mountains covered with pine-forests and large grassy plains, with increasing signs of cultivation: but the natives deteriorate, being no longer the civil honest people of the desert. This we attributed to the near approach of civilized towns, as it became more marked when we approached Kiachta.

These two towns stand alone in the Desert, being 605 miles from Kalgan and 175 from Kiachta. The whole transport of goods to and from Russia passes through them, and re-arrangements are generally made at Mai-Mai-Chin for the continuation of the transport, which accounts for that town—which is purely Chinese, and a very flourishing one—being built by the cunning Celestials in front of Kurin, and so intercepting the trade.

We left again on the same evening, and crossed three mountain passes, and had to hire oxen to take our carts over, camels being useless when ascending for draught purposes; and very hard work it was, as a great deal of snow had fallen, and, it being frozen, the ground was very slippery. The highest elevation was 4500 feet. We passed afterwards over a succession of what seemed boundless undulating prairies, and shot on them a few wild gurush, a small species of deer, but not very palatable eating. On the 15th we crossed the rivers Boro and Cara—on the ice.

We passed more yourts as we advanced, but very poor in appearance compared to those we had seen on the Desert. On the 16th we reached Baingol, a small collection of yourts, and here the cold became intense. We were much annoyed by violent storms of sleet, and the wind was so strong that even our camels refused to advance against it, and we had to make frequent halts; we were perfectly miserable, our fingers frozen and no means of getting warm, as we could not light a fire or pitch a tent. We crossed over the Rivers Orogol and Sharogol on the ice. On the morning of the 17th we entered what seemed an interminable wood, gradually descending towards a vast plain, at the end of which we felt sure Kiachta was situated; and our surmises proved correct, for at four in the afternoon we distinguished the two white spires of the Russian churches which mark the spot. To describe our feelings would be impossible: twenty-three days we had been wandering in Mongolia; during that time we had never slept under any shelter but the wretched one that our carts afforded us, which was, at the least, an aggravation of misery. We entered Kiachta (lat. 50°, long. 106°) on the morning of the 18th November, 1869. The thermometer was then standing at 40° below zero; and here, at the comfortable residence of a Russian gentleman, our journey thus far ceased.

A few observations will conclude all I have to say. Mongolia is believed to be divided into two divisions, North and South: North comprises four provinces; South eight or ten. There are three routes known by natives from Kalgan to Kurin: one, usually travelled over by caravans; another, which we came by, rather shorter;

and one, reserved by the Chinese Government for post-couriers—the longest.

The population is divided into clans; but as they have no method of obtaining a census, their number is unknown. Few of them, even of their Lamas, know how to read or write. Their language is distinct from Tartar or from Chinese, although Chinese is the character used, they having no alphabet or literature of their own. They live in the Desert, travel about with their camels, and subsist on their flocks of sheep, selling the wool to Chinese and Russians. Where a village of yourts may have existed a week before, no traces of it may be found after that period, they being constantly on the move, which renders it impossible to fix correctly the whereabouts of any village or town.

I would strongly advise any who wish to travel this route to do so at the same season in the year as we did, as although it is cold there is no fear of rain, which in other seasons is very abundant. The ground is hard and better for travelling over, and the camels are in winter condition, being useless in summer.

The PRESIDENT tendered the thanks of the Society to Mr. Whyte for his paper. A few years ago a delightful description of a large portion of Mongolia was given by Atkinson, the well-known traveller. Though the difficulties to be overcome in crossing that wild region were very great, one English lady, Mrs. Atkinson, had accomplished the journey, and he was happy to find the Government had—on her own account and for her very attractive and instructive volume descriptive of her journey—recognised her claims since the death of her husband, and granted her a small pension.

Mr. LOCKHART thought if the author of the paper had remained longer in Pekin he would have seen beauties even of architectural decoration there. No doubt political troubles had caused a great deal of dilapidation, but a country that had maintained itself for so many centuries, that had produced a large amount of wealth, that had blessed the world with many of its products, whose mountains and valleys were cultivated to an extent far beyond anything to be seen in England, that had an extensive literature, the production not only of the learned in past years, but of scholars of the present day, that had universities scattered throughout the country, to which thousands of students resorted for their examination—such a country could not be in quite so sad a state of ruin and decay as the paper intimated. He had been in houses and temples at Peking which were as handsome and as well kept, in Chinese fashion, as our houses and temples in England. The Temple of Heaven was one of the handsomest and most interesting buildings he had ever stepped into. He differed from Mr. Whyte in these few particulars, but he gave him all credit for the very pleasant and interesting manner in which he had detailed his adventurous journey across the plains of Tartary.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *Results of the Examinations of* 1870 *for the Prize Medals offered by the Royal Geographical Society to the principal Public Schools of the United Kingdom; and Programme for* 1871.

List of Schools invited to compete in 1870.

English Schools.—St. Peter's College, Radley, Abingdon; King Edward's School, Birmingham; Brighton College; Cathedral Grammar School, Chester; Cheltenham College; Clifton College; Dulwich College; Eton College; Haileybury College; Harrow; Hurstpierpoint; Liverpool College; Liverpool Institute; London,—Charter House; Christ's Hospital; City of London School; King's College School; St. Paul's; University College School; Westminster School; Royal Naval School, New Cross;—Manchester School; Marlborough College; University School, Nottingham; Repton; Rossall; Rugby; King's School, Sherborne; Shoreham; Shrewsbury; Uppingham School; Wellington College; Winchester School.

Scotch Schools.—Aberdeen Grammar School; Edinburgh Academy; Edinburgh High School; Glasgow High School.

Irish Schools.—Royal Academical Institute, Belfast; Ennis College; Portora Royal School, Enniskillen; Dungannon Royal School; Foyle College, Londonderry; Bathfarnham, St. Columba's College.

Nineteen of the above Schools furnished competitors, according to the following list, in which is entered the number of candidates in political and physical geography from each school:—

	Physical.	Political.
King Edward's School, Birmingham	1	0
Cheltenham College	2	1
Clifton College, Clifton	2	3
Haileybury College	1	1
Liverpool College	3	3
Liverpool Institute	1	1
Charter-house School	1	0
City of London School	4	4
University College School, London	1	0
Dulwich College	4	4
Westminster School	2	1
Manchester Grammar School	3	2
University School, Nottingham	1	2
Rossall School, Fleetwood	4	4
King's School, Sherborne	4	0
Glasgow High School	0	1
Royal Academical Institute, Belfast	3	0
Ennis College	1	1
Portora Royal School	0	1
Total	38*	29*

* Of these the following were withdrawn through illness or other causes:—Three in Physical (Belfast R. Acad. Instit., Clifton Coll., and King's School, Sherborne), and two in Political (Haileybury Coll. and Glasgow High School); leaving the numbers actually competing thirty-five and twenty-seven respectively.

The Examiners appointed by the Council for 1870 were the Very Rev. J. S. Howson, D.D., Dean of Chester, for Political, and Mr. A. R. Wallace, F.R.G.S., for Physical Geography; the papers set by these gentlemen were as below. The examinations were held at the various schools, on the 28th of March, and the results were announced at the Anniversary Meeting of the Society on the 23rd of May.

PHYSICAL GEOGRAPHY.

No. 1 Examination Paper.

A.—Configuration of the Earth.

1. What are the distances in geographical miles between the following places, measured in a direct line? (*a*). London and Gibraltar; (*b*). London and Naples; (*c*) London and Iceland; (*d*). London and Vienna; (*e*). Calcutta and Jeddo; (*f*). Cape Horn and New Zealand; (*g*). Natal and Swan River?
2. What places lie on a straight line (or great circle) drawn as follows: (*a*). From London to Alexandria; (*b*). From Calcutta to Sydney; (*c*). From Halifax to Mexico City?
3. Draw a section along a straight line between the following places:—(*a*). London and Gibraltar; (*b*). Washington and San Francisco. On these sections give the great features of the country; such as the proportion of land and sea, the positions and altitudes of rivers, plains, and mountains.
4. What is the relative extent of the following districts, as compared with Great Britain? The Sahara, the Prairies of North America, the great inland basin of Central Asia, and the inland basin of the Great Salt and other lakes in North America?
5. What are the altitudes, in feet, of the following mountains, plateaux, &c.? The Alleghany Mountains, Lake Superior, Lake Baikal, Lake Titicaca, plateau of the Cassiquiare?

B.—General Physical Geography.

6. State how the distribution of heat over the globe is estimated, and the temperature of different places compared.
7. Name the districts of greatest and least mean temperature in proportion to latitude in the Northern Hemisphere.
8. What is meant by the distribution of Magnetism over the Earth?
9. Define the magnetic poles and equator, and give their position.
10. State the chief contrasts in the distribution of rain over the globe.
11. Name the districts where the following minerals occur most abundantly: tin, copper, coal, diamonds.
12. What families of plants are most exclusively tropical?
13. What regions are most remarkable for the abundance of peculiar plants they contain?
14. Taking the old geographical divisions—Europe, Asia, Africa, North America, South America, Australia—state how far these are characterised by peculiar animal productions.
15. Give the native country of the Yak, Tapir, Howling Monkey, Toucans, Hornbills, Cassowaries, Golden Pheasant, and Wild Turkey.
16. Name six islands which are remarkable for their peculiar animal productions, and particularise one animal confined to each of them.

Note.—The word "animal" is meant to include all forms of animal life as distinguished from plants.

No. 2 Examination Paper.

Physical Geography of India.

1. Describe the natural boundaries of India, and give its chief dimensions and area as compared with Great Britain.
2. What are the great natural divisions of India, as regards surface-contour and elevation?
3. Give the length, width, altitude, and chief physical features of the Himalayan Mountains.
4. Give the directions and altitudes of the chief mountain-ranges of the Indian Peninsula, and the position of its chief table-lands.
5. Describe the position and extent of the great plain of India; give its area, and the amount of depression that would convert the Indian Peninsula into an island.
6. Name the chief rivers of Southern India, their positions and comparative size.
7. Give the position, shape, dimensions, and altitude of Ceylon.
8. Describe the position and general physical features of Bootan, Cashmere, Sinde, and Malabar.
9. Describe, generally, the climate of the Punjab, Simla, Darjeeling, Calcutta, and Mysore.
10. What are the great divisions of India as regards vegetation, and what are its botanical relations to other parts of the world?
11. What animals or groups of animals are characteristic, respectively, of Northern India, Southern India, and Ceylon?
12. What are the chief races of man inhabiting India?

POLITICAL GEOGRAPHY.

No. 1 Examination Paper.

General.

1. What is meant by great-circle sailing? What are its advantages, and, in some cases, its disadvantages? Illustrate your answer by voyages from Melbourne to Cape Horn, and from Cape Horn to Canton. What are the lengths of these two voyages in geographical miles? When does a rhumb line coincide with an arc of a great circle? What are the characteristic differences between a nautical chart and a common map? What is Mercator's Projection?
2. What is the length of a degree of longitude at the Equator, at the Tropics, and in the latitude of London? What is the difference of time between noon at Moscow and noon at Valparaiso? What are the special phenomena of Day and Night and of Summer and Winter within the Arctic and Antarctic Circles?
3. How has the progress of human enterprise and civilization been facilitated or impeded by the long slope and short slope of the great masses of land in the Continents of Asia and North America? Draw sections—of the former from the mouth of the Lena to Cape Comorin, and of the latter from San Francisco to New York.
4. Compare Europe and Africa, in regard to their relative proportions of area to coast-line. Give the relative sizes of the following islands:—Sicily, Java, St. Helena, Elba, and the Isle of Wight; and of the following lakes:—Windermere, Ladoga, the Dead Sea, Como, and Lake Superior; also the relative lengths of the Thames, the Volga, the Loire, the Orinoco, and the Elbe, and the relative heights of Mount Ararat, Chimborazo, Snowdon, and the Brocken.
5. Draw a map of the Gulf of Mexico and the Carribbean Sea, inserting the West India Islands and noting the political powers to which they severally belong. In this map insert some parallels of latitude and some meridians of longitude, and state what parts of the Old World are intersected by the former.

6. Enumerate in order the counties of Ireland which touch the sea, following the coast-line, and naming also in succession the principal bays and promontories. When was Ireland divided into counties, and what is the meaning of the word "pale" in Irish history?
7. What are the chief coalfields of England? What are their respective characteristics, and what predominant manufactures are connected with each?
8. Describe (or exhibit on a map) the Provinces of France which were under the rule of England at the end of the reign of King Henry II., stating in each case how we obtained possession of them, and how they ultimately passed from our hands. What were the last remnants of our French possessions?
9. What traces have been left on the map of Europe, and in the European languages, of the incursions of the Barbarians in the fifth century? What great movements of population are now going on in the Continent of North America? What are their causes, and what do you expect their results to be?
10. Trace historically the geographical import of the words Asia, Italy, Adriatic, Scotland. What do you mean by Germany and the German Empire? What is the historical meaning of the words Maryland, Louisiana, Carolina, Natal, and Sodor?
11. Where are the following places:—Navarino, Blenheim, Rheims, Guiza, Varna, Khartoum, Ravenna, Port Mahon, Aden, Sarawak, Bahia, Archangel, Granada, Culloden, Ballarat? and what circumstances of historical interest are connected with any of them?
12. Give an accurate account of the following products:—*cochineal, mace, coral, isinglass, coir, cloves, lac, hemp, madder, argols, sulphur, saltpetre, cobalt, camphor, and linseed.* Whence are they obtained, and to what purposes are they applied?
13. Name in order the principal seaports which a vessel would pass in coasting along the shores of the Mediterranean from Gibraltar to Trieste. Compare the populations of the chief cities which you name.
14. Enumerate the chief passes of the Alps from Monte Viso to the Ortler Spitz. What are the respective elevations of these passes? What are the chief modes of communication across them? Between what separate nationalities and what political powers is this part of the chain of the Alps the boundary line?
15. What do we gain by having possession of the Falkland Islands and the Mauritius? Where are they? Who discovered them, and when? Describe the circumstances under which they came into our possession. What are the political divisions of the continent of Australia? What are their boundary lines, and what part of South America covers the same range of latitude?
16. Explain the following terms:—*climate, horizon, oasis, atoll, delta, plateau, glacier, scars, Fauna, mistral, steppe, isothermal line* and *cotidal line.* Illustrate any part of your answer by drawing.

No. 2 Examination Paper.

India.

1. Sketch a map of India from the mouth of the Brahmaputra to the mouth of the Indus, and from the Hindoo-Koosh to Point de Galle, marking the boundary lines of latitude and longitude, inserting the principal rivers and their affluents, indicating also the elevated and alluvial lands, and carefully tracing the general watershed from Simla to Cape Comorin.
2. What are the respective characteristics of the Eastern and Western Ghauts, and what is the mean elevation of the Deccan? What is the length of the course of the Ganges? What is the highest ground in Ceylon? What is the distance round the coast from Bombay to Madras, and how far is each of these two points in a straight line from Calcutta?
3. Describe the characteristic features of Benares, the Southern Hydrabad, Umritsir, and Kandy, as regards situation and outward aspect, archi-

texture, costume, and social and religious life. Illustrate any part of your answer by drawing.

4. Describe the circumstances under which Oudh and Assam came into our possession. In what political relation do we stand at present to the Mysore? What are the areas, respectively, of these three territories, and what their peculiarities?

5. Enumerate in order the rivers of the Punjab. Describe, with dates, the chief military invasions which have crossed this territory from the West. Give the circumstances and the positions of the principal battles which have taken place between the Sutlej and Delhi.

6. How is the supreme government of British India now constituted? How many separate local administrations are there in direct communication with this supreme government? and how many of them are invested with the power of passing laws?

7. How, in your opinion, is the success of the Suez Canal likely to affect the trade of India, the probable development of the railway system being taken into account? What railways are now made, or are in progress, in that country?

8. If you were to fix upon a position for the capital of India, what part of the country would you select? State fully the circumstances you would take into account in making such a choice.

9. What are the chief districts which produce *indigo*, *rice*, *jute*, *opium*, *cotton*, *coffee*, and *tea*? Do the imports of India usually exceed the exports, or the reverse? How is the balance redressed in the course of trade? With what other countries besides England does India now carry on an active trade?

10. What are the leading distinctions of race in the inhabitants of India? Which races seem to have occupied the ground first, and where are they found now? Give a popular classification of the languages of India.

11. Give the derivations and meanings of the words *India*, *Himalaya*, *Doab*, *Neilgherry*, *Cawnpoor*, *Coromandel*; also of the words *Parsee*, *Nabob*, *Rajah*, *Caste*, *Sepoy*, *Mogul*.

12. What is known or conjectured of the relations of King Solomon and King Alfred with India? What are the earliest voyages of which we have record, round the Cape of Good Hope to that country? What is meant by "the wealth of Ormus and of Ind" ('Par. Lost,' ii. 2)? Whence did the West Indies derive their name? Explain: "He does smile his face into more lines than are in the new map with the augmentation of the Indies" ('Twelfth Night,' iii. 3).

I.

REPORT TO THE COUNCIL, BY THE EXAMINER IN PHYSICAL GEOGRAPHY FOR 1870.

"GENTLEMEN,—The following are the names of the successful candidates in this year's examination:—

Medallists.

Gold Medal ..	GEORGE GREY BUTLER	*Liverpool College.*
Bronze Medal ..	MARTIN STEWART	*Rossall School.*

Honourably Mentioned.

Equal	WILLIAM HIND	*Cheltenham College.*
	GEORGE HUGHES	*Liverpool Institute.*
3.	FREDERICK JOSEPH BECKLEY ..	*King's School, Sherborne.*
4.	FREDERICK WILLIAM HUNT	*University College School.*
5.	HOBART FREDERICK WHITTINGHAM SHAWE	*Cheltenham College.*
6.	ERNEST C. THOMAS	*Manchester Grammar School.*

"The most characteristic feature of the papers submitted to me is the very general superiority of those on the special to those on the general subject.

Even those candidates who show an almost complete ignorance of general physical geography, have got up the subject of India, so as to answer a considerable number of the questions with tolerable accuracy.

"Out of the 35 papers on Physical Geography, only about 15 showed any competent knowledge of the subject; the remainder appearing to be written by boys who had not been properly prepared, and were very ignorant of what was required. Many have no clear notion of what is meant by *Physical*, as distinguished from *Political Geography*, as evinced by giving 'healthiness' or 'unhealthiness' as a sufficient description of the climate of a place. Several do not know what a *section* means, and instead of drawing one, write long descriptions of the line of section. Almost all give lists of *cultivated* products as a sufficient description of the vegetation of a district.

"It might, perhaps, be advisable to make these deficiencies known, at least to the masters of the competing schools, in order that they might not in future waste their time in superintending the examination of boys who have no possible chance of success.

"The questions most imperfectly answered by all the candidates are those which relate to the geographical distribution of plants, animals, and the races of mankind: a circumstance which is, no doubt, to be attributed to the very imperfect manner in which these subjects are treated, not only in school geographies, but also in works of much higher pretensions. Notwithstanding a note to the effect that the word 'animals' included the whole animal kingdom, most of the candidates appeared to understand it as applying exclusively to mammalia, and more especially to the larger domesticated mammalia.

"The prize papers, are, however, very good, and are well deserving of the honour they have achieved. That of the Gold Medallist in particular is excellent, not only for the amount of information well and clearly expressed in it, but also for the accuracy and beauty of its sketch-maps and sections, and its general neatness of execution, which latter quality, however, has had no weight in determining the high position it has attained, which is due solely to its other merits. That which has gained the Bronze Medal, although undoubtedly somewhat inferior, is also very good; and both these stand at a considerably higher level of excellence than those which follow them, and whose writers are deemed worthy of honourable mention. It is to be remarked that the two prizemen stood first and second respectively in the list of honourable mentions last year.

"Out of the seventeen schools which have competed in Physical Geography this year, only seven are worthy of special mention, as shown in the following list:—

	Number of Candidates.	
Liverpool College	3	Gold Medal, two inferior.
Rossall School	4	Bronze Medal, one good, two inferior.
Cheltenham College	2	First and fifth of honourable mentions.
Liverpool Institute	1	First honourable mention.
King's School, Sherborne ..	4	Third honourable mention, two inferior.
University College School ..	1	Fourth honourable mention.
Manchester Grammar School	3	Sixth honourable mention, two good.

"*May 5th*, 1870.

ALFRED R. WALLACE,
"*Examiner in Physical Geography.*"

II.

REPORT TO THE COUNCIL, BY THE EXAMINER IN POLITICAL GEOGRAPHY, 1870.

"GENTLEMEN,—I have the honour to report that out of the twenty-seven candidates whose papers have been submitted to me, the first and second in order of merit are:—

Gold Medal	George William Gent	*Rossall School.*
Bronze Medal ..	James Henry Collins	*Liverpool College.*

"To these, accordingly, I have awarded the gold and bronze medals respectively. Those whom I have placed next in order, are as follow:—

1.	Edward Crabb	*Manchester Grammar School.*
Equal	William Grundy	*Rossall School.*
	George Hogben	*University School, Nottingham.*
	J. D. Murray	*Clifton College.*
5.	Harold Bailey Dixon	*Westminster School.*

The interval being considerable between the first of these and remaining four.

"As regards the competitors in general, I observe that many of them give, correctly and well, such statistical information as can be obtained from books. In knowledge of this kind, probably, the second medallist is quite equal to the first; but in perception of the true interest of geographical study, and in general grasp of the whole subject, the Gold Medallist appears to me far superior to all the other candidates. I may be permitted to mention two defects which strike me as evident in most of the papers. Few of the candidates seem to appreciate the importance of geography as illustrative of history; and there is a general inability to make easy use of drawing in elucidation of geographical facts. And yet these combinations in the method of instruction are usually found very attractive to boys.

"Turning now from the candidates to their places of education, I am much struck by the circumstance that again the highest honours have been obtained by Lancashire schools. This is itself a geographical fact of some interest, and I may be allowed to have the pleasure of adding further that the groups of boys to whom the two successful candidates belong, convey the impression that the geographical teaching in *Rossall School** and *Liverpool College* is very good. The total number of schools which have furnished the twenty-seven candidates is twelve, viz., *Cheltenham College; Clifton College; Dulwich College; Ennis College; Liverpool College; Liverpool Institute; Manchester Grammar School; Portora Royal School, Enniskillen; Rossall School; University School, Nottingham; City of London School; and Westminster School.*

"*Chester, May 11th*, 1870. J. S. Howson,
"*Examiner in Political Geography.*"

PROGRAMME FOR 1871.

The Council of the Society have satisfaction in repeating the offer of Prize Medals for the ensuing year, and have invited the following Schools to take part in the competition:—

List of Schools invited to compete in 1871.

English Schools.—St. Peter's College, Radley, Abingdon; King Edward's School, Birmingham; Brighton College; Cathedral Grammar School, Chester; Cheltenham College; Clifton College; Dulwich College; Eton College; Haileybury College; Harrow; Hurstpierpoint; Liverpool College; Liverpool Institute; London,—Charter House; Christ's Hospital; City of London School; King's College School; St. Paul's; University College School; Westminster School; Royal Naval School, New Cross;—Manchester School;

* *Note by the Editor.*—The Head Master of Rossall ascribes the success of his boys to their unaided efforts, no special instruction in Political Geography having been given.

Marlborough College; University School, Nottingham; Repton; Rossall; Rugby; King's School, Sherborne; Shoreham; Shrewsbury; Uppingham School; Wellington College; Winchester School.

Scotch Schools.—Aberdeen Grammar School; Edinburgh Academy; Edinburgh High School; Glasgow High School.

Irish Schools.—Royal Academical Institute, Belfast; Dungannon Royal School; Ennis College; Portora Royal School, Enniskillen; Foyle College, Londonderry; Rathfarnham, St. Columba's College.

Syllabus of Examinations for the Prize Medals of the Royal Geographical Society *in* 1871.

Examination in Physical Geography.

This Examination will take place simultaneously at the several invited Schools, at the same hours and under precisely the same regulations as those in Political Geography.

No. 1 *Examination Paper* will consist of questions on the following subjects:—

A. *Configuration of the Earth*, as learnt by careful study of a globe. What are the distances, speaking roughly, between such remote places as may be specified? What places of importance lie on the direct lines between them, and what is the section along each? What are the relative size, elevation, &c., speaking roughly, of such well-known districts, mountains, and rivers, as may be specified?

B. *General Physical Geography.*—Distribution of land and sea, forests, plateaux, glaciers, volcanoes, man, animals, plants, and minerals, oceanic, meteorological, and magnetic phenomena.

*** Extra marks will be allowed for sketches, but only so far as they are effective illustrations of what cannot otherwise be easily expressed. No marks will be given for neatness of execution, apart from accuracy.

No. 2 *Examination Paper* will consist wholly of questions on a special subject.

The special subject appointed for 1871 is—

The Physical Geography of British North America (exclusive of the Arctic Regions.)

Examination in Political Geography.

This Examination will take place simultaneously at the several invited Schools, according to printed regulations (which will be forwarded in due time), on the fourth Monday in March, 1871, and will consist of two papers of three hours each; the one to be answered between 9 and 12 A.M., and the other between 2 and 5 P.M.

No. 1 *Examination Paper* will consist of questions on the following subjects:—

A. *Descriptive Geography.*—Explanation of latitude and longitude. What are the distances in geographical miles, speaking roughly, and as learnt by the careful study of a globe, between such remote places as may be specified? What places of importance lie on the direct line between them? What is the relative size, speaking roughly, of such well-known countries, mountains, and rivers, as may be specified?

B. *Historical Geography.*—Embracing (1) the boundaries of states and empires at different historical periods; (2) the chief lines of commerce, ancient and modern; (3) the influence of geographical features and conditions upon the distribution of races and political history of mankind.

No. 2 *Examination Paper* will consist wholly of questions on a special subject.

The special subject appointed for 1871 is—

Geography of British North America (exclusive of the Arctic Regions), descriptive and historical.

*** Extra marks will be allowed for maps and sketches, but only so far as they are effective illustrations of what cannot otherwise be easily expressed. No marks will be given for neatness of execution, apart from accuracy.

2.—*Report on the Suez Canal.* By Captain Richards, R.N., F.R.S., Hydrographer to the Admiralty, and Lieut.-Colonel Clarke, C.B., R.E., Director of Engineering and Architectural Works, Admiralty.

(Reprinted from the Official Report.)

In accordance with instructions from the Lords Commissioners of the Admiralty, contained in a letter from their Secretary, dated the 30th December, 1869, directing us "to proceed to Egypt, and to obtain on the spot the fullest information in our power as to the present condition of the Suez Canal and the Works proposed to be carried out in connection with it, and to report to what extent the Canal may be expected to be available for the purposes of Her Majesty's Naval Service, including the Transport Service, to and from the East," we have now the honour to make the following Report:—

1. Leaving London on the 13th of January, we proceeded through France to Marseilles, thence to Spezzia and Brindisi, at each of which places we remained a short time to inspect the engineering and naval works in progress, and reached Alexandria on the 28th of January, where H.M.'s surveying vessel *Newport*, Captain Nares, was waiting to convey us to Port Said.

2. Sailing from Alexandria at noon of the 29th, Port Said was reached early on the morning of the 30th; on the passage were passed the three iron pile lighthouses on the Rosetta Mouth, Brulos Point, and Damietta entrance of the Nile, which are all but complete, and when lighted will prove most useful guides to vessels passing along this low and shallow coast, where the currents are uncertain, and after westerly winds sometimes attain a velocity of 2 miles an hour, with an indraught setting strongly into the bights: on this account vessels will do well not to approach the shore nearer than 7 or 8 miles. The high light of Port Said, which stands at the inner end of the western breakwater, was seen at a distance of 25 miles; and bringing it on a bearing, s. w. ½ w., we steered in on that course, passing the end of the western breakwater, within ¼ of a mile, in 5 fathoms of water, and then between the buoys which mark the channel, into the inner basin, carrying 25, 26, and 27 feet of water, occasionally 28 feet, where the vessel was secured to the mooring buoy of the "Messageries Impériales."

3. No time was lost in communicating with the English vice-consul, who introduced us to the Egyptian governor, and to the officials of the Canal Company, *viz.*, M. Pointel, Captain in the French Imperial Navy, chief of the transit and navigation departments at Port Said, and M. Blondel, at present the resident chief engineer for the whole of the Canal works; from these gentlemen we received the most ready offers of assistance, and a promise that the whole of the drawings and other documents in their possession should be placed at our disposal.

4. During the day a cursory examination of the beach line to the westward of the Port, and of the Port itself, was made; from which it was decided that it would be desirable to make a more detailed survey of it than already existed; it was arranged accordingly to leave behind a party from the *Newport*, for this purpose, while we proceeded with the examination of the canal.

5. The plan which appeared most advisable to adopt, with the view of carrying out our instructions to the greatest advantage in the time at our disposal, was as follows:—To proceed, in the first instance, through the canal to Ismailia, there communicate with M. Guichard, the chief administrator of the Company, in the absence of M. de Lesseps; thence on to the southern end of the canal at Suez; and after inspecting the Government and Company's works there, to return over the same ground to Port Said, finish the survey, and make a further examination of that locality; and, finally, to complete our operations at Ismailia, by examining Lake Timsah. By these means we should have the opportunity of dropping parties to observe the tides at different points, and of making the fullest investigation in our power of the canal itself, probably under varying conditions.

6. On the morning of the 31st we were joined by M. Le Baron La Tour, an officer of the Company, whom M. Guichard obligingly attached to us during the whole of our stay; and the intelligence and perfect local knowledge possessed by this gentleman proved of the greatest service to us throughout. Leaving Port Said on the same morning, we proceeded to carry out the arrangements, as above explained, and, having completed them, finally quitted Ismailia on the 8th February, for Cairo, by rail. The *Newport* returned the same day to Port Said, where, assisted by the *Prompt*, transport tender, she remained sounding the port and its approaches, and making sections of the former, until the 11th February, when she left for Malta.

7. It will be seen, then, that twelve days were occupied on the canal and at Port Said, and during this time every opportunity was taken advantage of to gain the fullest information on the subjects pointed out in our instructions, both by ourselves and the surveying officers of the *Newport*. In these instructions there are three principal points to which attention is drawn, viz.:—

The present condition of the canal;

The works proposed to be carried out in connection with it; and

The extent to which it may be expected to be available for Her Majesty's Naval Service.

8. Before entering into a detailed description of the present state of the canal, or of the means which were resorted to in order to gain a correct knowledge of its condition, it seems desirable to note briefly the extent and character of the work, as determined on by its designers and constructors, and it will be then more readily seen to what extent these conditions have been fulfilled.

9. The whole length of the canal from the High Lighthouse at Port Said to its junction with the Red Sea at Suez, may be stated as nearly as possible, at 88 geographical miles; of this distance 66 miles are actual canal, and 22 miles of the navigation runs through the three lakes, viz., Timsah, and the great and small Bitter Lakes; excavations had to be carried out, however, throughout the whole length of Lake Timsah; of the small Bitter Lake, and a portion of the great lake, leaving a distance only of 8 miles in the latter, where the natural depth exceeded that of the canal, and where, consequently, none were necessary.

10. The width of the canal at the surface, throughout the greater part of its length, was finally decided to extend to 325 English feet, having a floor 72 feet wide in the centre, with a depth of 26 feet, sloping up 2 to 1 till within 5 feet of the water surface, where the section is for 50 to 60 feet, either level or with horizontal benches, ending in slopes of 5 to 1; at three places, however, where its course runs through high ground, and where the labour of removing the soil would have been attended with very great expense, and occupied a considerable time, the width has been reduced to 195 feet, with slopes of 2 to 1; these three spots occur in the neighbourhood of El Guisr, Sérapéum, and Chalouf, and are respectively 8, 5½, and 4 miles in length, making, in the

whole, about 18 miles of narrow cutting. It will thus be seen that the canal was generally to have a water way 26 feet deep for a width of 72 feet, 20 feet deep for 95 feet, and 15 feet for a width of 112 feet.

11. In order to test to what extent these intentions had been carried out, it was necessary to make accurate sections of the canal throughout its length, and 52 of such sections were made accordingly, exclusive of 8, which were subsequently taken across Port Said; the results proved that on the whole, with a few exceptions to be noticed presently, the work had been fairly completed according to the original, or, rather, the modified design; and though it is not to be doubted that the opening was probably in some degree premature, and that though much remains to be done to improve and facilitate the transit, especially for large ships, yet it is at the present moment undeniably a navigable canal for vessels of considerable draught and tonnage, and its success has probably far exceeded the most sanguine expectations of its warmest supporters; it must not be understood that there is the exact depth and breadth uniformly throughout the canal which it was the intention of the engineers there should be; the deepest water, for instance, as shown by our sections, is not always precisely in the centre, nor is there always the exact width which was laid down; occasionally it is less, in some cases even greater, but the depth does not differ more than was to be expected under the circumstances, or so much as materially to affect its practical value, with the exception of the cases now to be noticed, and which are in course of being remedied.

12. The first of these faults, and where a dredger was at work removing it, occurs at section 19, 33 miles from Port Said, between Kantara and El Guisr, here the greatest depth is 22 feet, but only for a width of 30 feet, and for a width of 80 feet a depth of 20 feet only can be commanded; this occurs at Lake Ballah, where there is no eastern embankment to the canal above water.

13. The second bad place occurs at section 27, 44¼ miles from Port Said, just where the canal proper commences, at the south end of Lake Timsah; here also 22 feet is the greatest depth, and that only at one spot; 20 feet can be carried for a width of 55 feet, and 18 feet for a width of 72 feet. A dredge was also at work deepening this spot.

14. The Sérapéum rocky section forms, or rather did form, the next and greatest difficulty. The thin stratum of gypsum, which extends more or less along this section, at a depth of 17 feet below the water-line, suddenly increased for a length of about 80 yards, from a few inches to a thickness of 7 feet, and which, lying between two trial borings, was unfortunately not detected till after the water had been let in, and close on to the time fixed for the completion of the works. When discovered there was scarcely 17 feet of water over it, but at the time of our examination it had been almost removed by blasting and dredging; three dredges were at work, and we witnessed huge blocks of the stone being brought up by the buckets, to the no small damage of the latter, which were split and broken through the tearing away of the rock by the powerful steam machinery; the efforts indeed which were being made to remove this difficulty were very great, regardless of every obstacle, and some sections with which the engineer was good enough to supply us, confirmed by some sight we made ourselves, left no doubt that they had all but been overcome; and we have every reason to conclude that, since our visit, this part of the canal, as far as depth is concerned, has been made equal, if not superior, to any other.

15. At the distance of a mile south of the Sérapéum operations, or 51¼ miles from Port Said, at section 35, there is another shallow place where 22 feet is the greatest depth, for a width of 50 feet; for a width of nearly 70 feet not more than 20 feet can be carried, and for a width of 80 feet there is no more than 18 feet; this obstacle was to be removed by the dredges immediately.

16. The last weak place to be noticed is at section 47, within 3 miles of the

Suez entrance of the canal, and here not more than 23 feet was found, and for a width of 50 feet no greater depth than 22 feet; this, however, was at low water, and it is to be borne in mind that at this end of the canal a rise and fall of the tide may be depended upon to the extent of from 4 to 6 feet; a dredge was at work improving this part, which at present is probably the most imperfect portion of the canal.

17. Independently of the weak points which have now been described, some of which have been already remedied, and all of which it may fairly be expected will be so, within three or four months from the time of our visit—early in February—the next difficulties are the curves, five in number, in passing most of which great care and attention will be necessary in piloting a long vessel. The first occurs immediately after entering the canal from Port Said, but it is so moderate that there is little difficulty in passing it; two others occur between Kantara and El Guisr; the latter, just before entering Lake Timsah from the north, is the sharpest in the canal, and is in course of being widened. The fourth is also rather a sharp turn, and is near the south end of the Little Bitter Lake; the fifth and last is within 2 miles of Suez. Otherwise the channel is straight; and with the exception of about 2 miles on the eastern side of the canal at the south end of Lake Ballah, nearly the same distance on its western side at the southern extreme of Lake Timsah, as well as throughout the whole extent of the three lakes, there is a solid dry embankment, varying in height from about 5 to 10 feet in the flat part to 50 or 60 in the higher portions.

18. Throughout Lake Timsah, and from where the embankment terminates at the north end of the Great Bitter Lake to the Lighthouse at the north end of the lake, a distance of about 1¼ mile; also from the Lighthouse at the south end of the lake, throughout the length of the Little Bitter Lake, to where the embanked canal again commences, the deep channel is marked by conspicuous iron beacons on either side; these beacons are 250 feet apart, and the deep-water channel between them is the same in width as in the rest of the canal; but in practice it is found more difficult to keep in the centre while passing through these beacons than it is when between the embankments.

19. The iron pile lighthouses at the north and south ends of the Great Bitter Lake are 8 miles apart, and visible the one from the other. In the space intervening, the water is 2 or 3 feet deeper than in the canal; and ships are not therefore obliged to follow any direct course through the lake, but may proceed or anchor as convenient.

20. At every 5 or 6 miles between Port Said and Lake Timsah—the whole distance being 42 miles—there is a *gare* or siding to allow large vessels to bring up in either for the purpose of passing each other, or to moor for the night. These *gares*, which are temporarily marked by posts driven into the banks, are merely extensions of the width of the floor of the canal under water, and are not sufficiently capacious, but they will, it is stated, be enlarged. That at Kantara, 24 miles from Port Said, is exceptionally large, and can accommodate three large vessels.

21. The pilots are of course well acquainted with the positions of these sidings; there is, or is to be, a telegraph station established at each of them, with a competent nautical official who is to regulate the movements of passing vessels, according to directions which will be communicated by telegram from Port Said, Ismailia, or Suez. Telegraph wires are established throughout the length of the canal.

22. The best stopping places for ships after nightfall, and during sand-drifts, or high winds, when the passage of the canal would be attended with risk of grounding, are the Kantara *gare*, Lake Timsah, and the Great Bitter Lake, which are respectively 24 miles, 42 miles, and 56 miles from Port Said. Lake Timsah at present has not more than 21 and 22 feet of water; and with a long ship some difficulty is experienced in entering the channel of the canal from

the lake; a sufficient portion of the lake is to be improved to render it a convenient stopping place.

23. Such, then, is the present state of the canal. The second clause of our instructions, respecting the works proposed to be carried out in connexion with it, is now to be considered.

24. From M. Guichard, the chief authority on the spot, we learnt that when the Company took over the works from the contractors, they were quite aware of the weak points detected by us in our examination, and decided on completing the undertaking themselves, for which purpose, and also to maintain the canal in a navigable condition, eight powerful dredges, and a proportionate quantity of mud-hoppers and other plant, have been permanently retained.

25. It was intended to proceed immediately with the improvement of those points to which we have alluded as faulty, by reducing the sharpness of the curve at El Guisr, widening it and the other three "curves of danger" to 130 feet at the floor of the canal, and making the channel from the entrance of Port Said to the inner basin 30 feet deep, as well as increasing its width. In effecting the improvement of the curves, it is computed that about 451,000 cubic yards of excavation will have to be made, and a further removal of 1,100,000, it is said, would go far towards perfecting the canal; but the latter, being regarded by the Company as unnecessary for the actual requirements of navigation, is not likely to be undertaken at present.

26. It is also intended to mark the banks of the canal by conspicuous beacons at every mile, instead of by the temporary kilomètre marks which now exist only between Port Said and Lake Timsah. At every cable's length, or tenth of a mile, substantial pillars or bollards, for securing ships and heaving them off, are to be embedded in the banks on both sides; and the limit of 16 feet depth of water is to be marked on either side by buoys at a distance of a fifth of a mile from each other, or 400 yards apart, these buoys to be moored with a chain and sinker, and further secured by a second chain to the pillars on shore. We were assured that these pillars and buoys were being prepared at Trieste, and within four or five months would be in their places; if so, the advantages and convenience to passing vessels will be considerably increased, for the great drawback at present is the want of appliances for heaving a vessel off of the ground, or of making her fast should it be necessary to stop.

27. It is expected that the whole of the improvements above mentioned will be completed by the close of the present year, the more especially as we have been informed by M. Lesseps himself, subsequently to our visit, that there is not to be any delay in commencing them.

28. Having thus described the canal proper, there remains to be noticed the Mediterranean entrance at Port Said, to which the greatest importance has been attached by all the authorities who have considered the whole question; and, indeed, on no point has there been entertained a more general diversity of opinion than on the practicability of maintaining this artificial harbour.

29. The greatest difficulty anticipated by those who were well qualified to form an opinion was, that the large quantity of deposit constantly being carried eastward from the Nile would rapidly pile up against any artificial barrier that might be constructed, and form a shoal across the entrance of the canal, through which it would not be practicable to keep a ship channel open: and on the correctness or otherwise of these views of course depended the success of the undertaking. M. Lesseps, however, boldly confronted the difficulty, and his decision has been justified by the event. That the operations of nature have in some degree—indeed, to some considerable extent—produced the result anticipated, is not to be denied, as will be evident from an inspection of the plan of Port Said, which accompanies this report; but it is quite manifest, from the rate at which the accumulation of sand is taking place, as shown by the periodical observations of the French engineers, and by our own

examination, that any practical inconvenience to navigation from this cause may be considered as remote; but if at any future time it should arise, the remedy is sure and simple, viz., an extension of the breakwater.

30. Port Said, though affording sufficiently good anchorage for small vessels, cannot be considered a harbour, either in respect of extent or depth, for vessels of large tonnage and great draught of water. It is formed by two rough, narrow, and low breakwaters, of unfinished appearance, enclosing an area of some 450 acres, with an average depth of only 13 or 14 feet of water, except in the ship channel leading to the inner basins, where the depth is from 25 to 28 feet.

31. The western breakwater, which extends for 6040 feet at right angles to the shore, and is slightly curved to the eastward towards its extremity, was commenced in 1860, and carried out about 1300 feet, beyond which point, and at a short distance from it, was deposited a heap of stones that was surrounded by iron piles, and, from its detached position, was called "The Island." The work was then left untouched till 1866, when the breakwater was joined to the island, and it was continued to its present length, and finished in 1868. From the mainland to the island the breakwater is formed, on its inner side, of a bank of rubble stones, surmounted by a promenade, over which the spray breaks with a very moderate north-west wind, and on the outer or sea front of concrete blocks, but beyond the island to its termination it is entirely constructed of large blocks of artificial stone, composed of one part of French hydraulic lime with two parts of sand, and some of which were transferred to it from the eastern breakwater. This latter, which is also constructed of large masses of concrete, is of more recent construction; it extends about 6020 feet, and converges towards the western breakwater.

32. Both structures are deficient in width, and from the rough way in which the blocks are deposited some amount of silt finds its way through the interstices, while from their slight elevation the sea, during fresh north-west winds, washes over them, bringing with it a certain quantity of sand.

33. It is said, and probably with truth, that it is only during strong winds that the silting up occurs through either cause, to any extent. That the current does not always run to the eastward, but after easterly winds in the contrary direction, is evident; and at the inner part of the eastern breakwater, where some of the blocks were removed for the purpose of completing the outer portions, thereby leaving a breach, the effect of an easterly current or an easterly wind is plainly to be seen in the sand accumulated.

34. From an examination of the French plans, and by our own measurements, the shore has extended seaward along the outside of the western breakwater since 1860, or, in ten years, 1220 feet; the action of the current has thus reclaimed, in that period, in an angular form, an area of about 45 acres. An inspection of the French diagrams shows that this process of silting has not been uniformly progressive; during some periods, indeed, it has been stationary. The area included within a line drawn from the eastern end of the breakwater to the tangent of the beach line, about 3 miles, to the westward, is 1400 acres, and from this some idea may be formed as to the remoteness of the time when any practical inconvenience to the harbour will result through the process of silting.

Two proposals have been made for obviating the influx of sand through the western breakwater into the ship channel; one being to cut parallel with the breakwater a small trench into which the sand would fall as it came through, the other to dredge the channel so as to keep it always at 9 mètres or 28½ feet in depth, and this it is considered could be accomplished by the employment of a dredger for thirty days in every year.

35. It will thus be seen that while there need be no apprehension of difficulty in keeping open the ship channel by either of these methods, or by the

improvement of the breakwaters—which, however, appear to answer the purpose for which they were designed, viz.: to afford shelter to the inner basins and canal—there is no obstacle to the formation of a deep-water harbour in the Avant port, which may be dredged to any depth; but it is doubtful whether such increased depth would be an advantage, as the shoal water protects the inner basins from the sea.

At present a deep channel only, which, as before observed, is to be widened and deepened to 29 or 30 feet, has been opened for the passage of ships; it is not sufficiently buoyed for vessels entering without the aid of a pilot, but will be improved in this respect.

36. South-west gales are the heaviest on this coast, but being off shore, they produce no sea. N.N.W. and north-west are the prevailing winter winds; but they are not often heavy, and the breakwater affords protection from them. The summer winds are north-east which is right into the Port, and though they seldom blow with great strength, yet they generally send in sufficient sea to prevent dredging operations. November is said to be the quietest month, and it is calculated that the dredging already alluded to will always more than suffice to ensure the necessary depth in the channel of Port Said. During our stay in February, a strong north-east wind set in, on one of the mornings on which we went out in the steam tender to examine the entrance; it is probable that a vessel drawing 23 feet of water, would on this occasion have touched the mud with her keel; this breeze was, however, but of a few hours' duration, and the same strength of wind would probably have prevented a vessel of similar draught from entering the harbour of Alexandria.

From this and subsequent examinations it appears quite certain that no shoals have been formed, and no decrease has taken place in the depth of the water near the pier ends since the completion of the breakwaters.

37. It may be well to mention here, that the shoal on which two of our iron-clad ships grounded, on the occasion of the opening of the canal, was entirely caused by the deposit of the soil dredged from Port Said; it is shown on the chart, and the marks for clearing it sufficiently described in the nautical directions.

38. There is a small light exhibited on each of the pier ends: Port Said Lighthouse itself stands at the inner entrance of the western breakwater. It is a grey-coloured octagonal-shaped tower, constructed of concrete, 180 feet high, exhibiting an electric light visible at a distance of 25 miles, and it forms a noble beacon by day or night.

39. The inner basins are spacious, occupying an area of 137 acres, with a depth of 27 feet; they can be dredged at all times without difficulty, and are capable of indefinite extension either on the western or eastern sides, especially on the latter, where they would be even more sheltered than the present western basins.

40. The port of entry at the Suez terminus is easy of access. A breakwater protects the canal entrance from southerly winds, and a basin is in progress of construction by the Company. The Egyptian Government works at Suez are likewise extensive; they consist of a dry dock, 416 feet long, with a width of entrance of 78 feet, and a depth over the sill of 22 feet. The *Forte*, one of our largest frigates, and the *Jumna*, one of the large Indian transports, have lately been docked there; there are also two capacious basins, a naval and a commercial one: the former is nearly finished, and admits the largest ships of the Peninsular and Oriental Company to lie alongside, with a draught of 21 feet 6 inches; a single dredge, in a few days, would render it available for the Indian transports. The Commercial Basin is in a less complete state, but will probably be finished in the course of twelve months, when nothing will be left to be desired in respect of basin and dock accommodation at this place.

41. There is steam communication between Port Said and Ismailia daily,

and railway from the latter to Suez: leaving Port Said at 7 A.M., Suez is reached between 6 and 8 P.M.; there is also a direct line of rail between Ismailia and Cairo, and the journey occupies about six hours; punctuality, however, is not to be depended upon. At the town of Zagazig where the cultivated part of the desert may be said to commence, 40 miles west from Ismailia, and about the same distance north of Cairo, is the Alexandria Junction of the line.

42. The fresh-water canal between the Nile at Cairo and Ismailia was completed in 1862, and connected with the maritime canal by means of two locks at Ismailia, and a short junction to the north end of Lake Timsah. About 3 miles before reaching Ismailia, an arm of this fresh-water canal branches off and follows nearly the line of rail and maritime canal, to Suez. Since the completion of this great work there has been an easy and abundant supply of fresh water throughout the length of the canal, which was formerly only scantily supplied by the constant labour of about 1000 camels. The northern portion of the canal, between Ismailia and Port Said, and the town of Said itself, are supplied from Ismailia, the water being forced by steam machinery through a double row of pipes along the banks of the canal. The depth of the fresh-water canal is about 4 feet, and it has been once emptied and cleaned out during the eight years it has been in existence.

43. The general questions now to be considered are those regarding the permanence of the canal works; and the comparative advantages which it will confer on navigation.

44. Most of the physical difficulties which it was anticipated would operate prejudicially on the canal, if not altogether bar it as a navigable channel, have certainly proved to have been fallacious. The difference of level of the two seas, so far as it has had any effect in producing a current one way or the other, is inappreciable: the tidal observations which we were able to make were necessarily somewhat imperfect from want of time, but they were made at that period of the moon's age when their effect would be greatest; the results show that in the southern portion of the canal between Suez and Great Bitter Lake, the tidal influence from the Red Sea is felt, there being a regular flow and ebb; the flood running in for about seven hours, and ebb running out for five hours; at the Suez entrance, the rise at springs, unless affected by strong winds, is between 5 and 6 feet; about half way from Suez to the Small Bitter Lake, a distance of 6 miles, it is under 2 feet; at the south end of the Small Bitter Lake, a few inches only, while at the south end of the Great Lake there is scarcely any perceptible tidal influence. We were informed by the authorities at Ismailia, that since the Great Lake has been filled, the level of Lake Timsah, which was filled from the Mediterranean in April, 1867, has risen 12 centimètres, or about 4 inches; and that its waters are continually running at a slow rate into the Mediterranean: certainly this statement agreed with what we ourselves remarked, for we always found a current running northward from Lake Timsah, at the rate of from ¼ a mile to a mile an hour. Limited, however, as these tidal observations were, they were taken with great care, and appear sufficient to show that, except at the Suez end, the tides will not materially affect the passage of vessels; at that end, therefore, large vessels must regulate their time of passing: indeed the greatest difficulty which will be experienced will be not from the tides, but from the prevailing north-east wind in the canal, which will make close steerage difficult in going from north to south.

45. With regard to the question of evaporation, it is impossible to say that a hot summer will produce no appreciable effect on the water of the Great Lake, but it may be fairly predicted, that no serious effect will result, sufficient to produce a disturbing influence on the general conditions of the canal, and thereby affect its navigation.

46. The doubts as to the practicability of keeping the Mediterranean entrance open have so far been dispelled by experience, and may, it is believed, be dismissed altogether. As to any difficulty of approaching Port Said by steam ships, under ordinary circumstances there is none; the coast is very low, but the masts of the shipping and the high lighthouse are conspicuous marks at a good offing, and it is only necessary to bring the latter on the bearing pointed out and steer for it. It is certainly not recommended to enter at night, unless with the aid of a pilot and under exceptionally favourable circumstances, or with a small vessel whose draught would permit her to anchor between the breakwaters, nor would it be prudent to run for the port in a gale blowing on shore: in this respect, indeed, Port Said may be considered under the same conditions as Alexandria; there is neither more nor less danger in the one case than the other, and in either there is sufficient sea room. Although the canal itself will not be used by sailing vessels, it is probable that such vessels will frequent Port Said, and there is no reason why in moderate weather they should not enter the inner basin; with westerly winds, however, great care must be observed not to be set to leeward or on to the east bank, or to miss the port, and with contrary winds steam tugs will be necessary; in moderate weather the anchorage outside is safe, but it is strongly recommended that sailing vessels should not approach the port in weather which would render the anchorage outside unsafe.

47. The impression which generally prevails that the navigation of the Red Sea is difficult and dangerous, is to a great extent erroneous, as will be readily admitted by those practical navigators who have had most experience in its waters; undoubtedly the Gulf of Suez which extends for 160 miles to its junction with the Red Sea at the Strait of Jubal is difficult navigation for a sailing vessel, and requires strict care and attention even with the aid of steam; but as its width is in no place less than 6 miles, and in most parts as much as 10, and free from any serious current disturbances, except when in close proximity to the shoals in the Strait of Jubal, it will be evident that if correct courses are steered, and proper precautions observed, there should be no risk of accident. The greatest difficulty experienced by a stranger is in judging his distance from the shore at night, owing to the high land lying so far back from the actual low coast line, and the peculiar haze which frequently prevails. Nor is the Strait so well lighted as it should be; but it is believed, that His Highness the Viceroy is prepared under certain conditions to remedy this latter difficulty, and at an interview with which he honoured us at Cairo, His Highness was pleased to grant his ready assent and assistance to enable an examination to be made of certain points in the Gulf—an examination which Captain Grant, R.N., then in the Red Sea, was good enough to undertake. The result is, that Ras Gharib, a prominent point on the western shore of the Gulf, about 100 miles from Suez, and 47 miles south of the present light on Zafarana point, may be considered a very eligible position for a lighthouse, and as there is an iron one with a complete lightning apparatus lying at Suez, it is to be hoped that steps will be taken for the establishment of a light on this point.

48. There is no doubt, moreover, that a more modern and detailed survey of the Gulf of Suez is necessary now that it has become so great a highway for the ships of all nations, and especially for our own. At the same time it is to be observed that the large steam ships of the Peninsular and Oriental, and other Companies, and our still larger Government transports, have long frequented this route in security by day and night.

49. In regard to the Red Sea proper—although from the circumstance of the winds generally blowing either directly up or down, and in consequence of frequent calms, its navigation must always be difficult and tedious for sailing vessels, it cannot be said to be dangerous. From the Island of

Shadwan, at the southern end of Jubal Strait, to the Strait of Babel Mandeb, where the Red Sea enters the Gulf of Aden, is a distance of nearly 1100 miles, and the average width is about 80, until within the last hundred miles, when the channel becomes encumbered by islands; but there is in no part a passage of a less navigable width than 11 or 12 miles. But few dangers exist in the centre of the sea, and there is everywhere a navigable channel of not less than 40 miles wide, entirely free from them. Still it would add to the convenience of navigation and give confidence to the seaman if it were better lighted. There is a good light at present on the Dadelus Shoal, which is nearly in mid channel, 180 miles from the Strait of Jubal. The Brothers Islands, which lie in a direct line, and almost intermediate between these points, offer an excellent site for a second light. A light is also much required at Mocha, 40 miles northward of the Island of Perim, at the entrance of Babel Mandeb Strait, on which there is already a good light. The light at Mocha might be a floating one, and if another lighthouse were placed on one of the small islets, just east of Jibbel Toogur and 50 miles northward of Mocha, the Red Sea might be considered as fairly lighted.

50. If these views are adopted, views it may be stated concurred in by Captain Grant, R.N., and generally approved by Captain Curling, R.N.R., of the Peninsular and Oriental Company's Service, an officer of great experience in the navigation of the Red Sea—four additional lights will be required, and it is strongly urged that no time should be lost in establishing them.

51. Having now dealt with and disposed of the difficulties, some real and others visionary, that have been anticipated, one other remains, and that is, not whether the canal can be kept open and maintained with comparative ease and little annual cost, but whether the passage by large ships may not at times be checked and delayed.

52. But before discussing this, having formed the opinion that its maintenance would not be a matter of so grave a character as has been predicted, we will state our reasons for arriving at such a conclusion:—A careful examination of the Sweet Water Canal, which runs for many miles parallel to and through the same soil as the Maritime Canal, showed that during the seven or eight years since its formation, though it has been once cleaned out, its section has been but little affected either by the erosion of its banks from passing vessels (and the traffic on it is very considerable), or by any large deposit of sand-drift from the desert. With reference to the former, we found that from the nature of the soil, and this of course applies to that of the Maritime Canal, which contains lime in large quantities, the banks below and a little above the water become hard and encrusted, and the ordinary wave or wash from a passing vessel, going at moderate speed, disturbs the surface but little, if at all.

53. Observations in the Maritime Canal showed the same results, more especially where the banks were steep and on a good incline, for there it was noticed that as the wave rose and fell, the water coming off them was not discoloured, nor did it bring back with it any sand or mud; but along those portions of the canal where on either side wide berms or horizontal benching have been left a little above or below the surface level of the water, considerable agitation of the soil took place, particularly when the vessel proceeded at a speed exceeding four knots, and the wave rolled off the banks heavily charged with the detritus of these berms, and much discoloured.

54. We regard this in point of construction as the least favourable feature of the entire work, and though in time, when the banks shall have assumed their natural sections, this disturbance may cease, yet till then, some little silting, necessitating continuous dredging operations to keep the centre of the canal to its normal width and depth, will be the result. Through these parts of the canal, as indeed throughout its entire course, except in the larger Bitter Lake, the speed should never be permitted to exceed 4 or 5 knots per hour, a

rate which under all ordinary circumstances, ruling the transit of a ship from sea to sea, is sufficient to ensure correct steerage.

55. Even were it advisable, the great cost and tedious nature of the operation of pitching the banks with stones, which to be at all effective would have to be carried below the line to which a ship in passing forces the water to recede, now that the canal has been filled, precludes the idea of its being even suggested by us. When we use the word pitching, we mean lining or covering the banks with stone fairly dressed and carefully jointed, cramped and set in cement or hydraulic lime: any other method would be useless, and indeed a source of mischief, as is apparent from the destruction of the rough pitching or deposit of stone, which has been placed along some parts of the African bank for the protection of the line of pipes conveying fresh water from Ismailia to Port Said.

56. The very insignificant decrease in the depth of the Sweet Water Canal since its construction leads us to hope that the apprehensions of deposits, in large quantities, of fine sand from the Desert have been much exaggerated; and we were assured, by those who professed to have examined the subject, that the drift sand usually passed over and not into the canal. Indeed, at the special points where the Maritime Canal can be affected to any great extent from this cause, and which are limited to the Seuils d' El Guisr, de Sérapéum, and Chalouf-el-Terrala, its passage is through comparatively deep cutting with spoil banks above the Desert level, which have a tendency to check the drift, and by creating currents, possibly of lower temperature and of but slight force, at right angles to the direction of the prevailing drift, prevent the sand from falling.

Further, the direction of the prevailing wind is up and down the canal, and this, even when blowing strong, causes little drift; but a south-west wind, which on one occasion blew stiffly for a few hours, caused an accumulation of sand on the ship's deck of $\frac{1}{16}$th of an inch in thickness.

57. We proceed, then, to the consideration of the question of how far the Maritime Canal is likely to answer its object, what difficulties may be anticipated in its navigation, and to what extent it may be expected to be useful for the purposes of Her Majesty's naval service, including the transport service to and from the East.

58. For all steam ships, or vessels towed, ranging between 250 and 300 feet in length, with 35 feet beam, and a draught of 20 feet, it will, with the improvements and appliances earlier described, be a convenient highway. It may, therefore, be assumed that, with the exception of the iron-clad ship at present stationed in the East, or any unusually heavy vessel, it will be a channel available for the passage to and fro of our India and China squadrons.

59. The maximum speed should never, except in the large Bitter Lake, exceed 5 miles an hour: this rule should not at any time be departed from, not only to prevent injury to the canal by the disturbance of the soil of the banks which greater velocity would occasion, but also to avoid accident to the vessel from striking the ground heavily, as she might do if she touched when going fast, which in the case of a propeller might occasion serious damage to the screw.

60. All vessels should be steered from the bridge, the pilot being alongside the helmsman, and those of the smaller class should, when approaching or passing each other, reduce their speed or stop, the width of the canal enabling them, by careful steering, to keep in deep water.

61. For the transit of vessels larger than those described, the canal is not so well adapted, and special arrangements, such as are observed on a single line of railway should be made and enforced.

The extreme length of such vessels would prevent their passing each other, except at a station; for any unfavourable circumstance—such as even a

moderate wind astern, which would cause a ship to yaw as much as a quarter of a point off her course—would probably place her on shore before she had time to recover her steerage; and, as there is no rise or fall of tide to float her off again, would necessitate lightening her very considerably, a process, it is needless to say, attended in a merchant ship with inconvenience, and likely to involve the blocking up of the canal, causing delay, perhaps of several days, to herself and other vessels.

The question of the present Indian transports passing through the canal with troops demands serious consideration; and there are so many points involved, that it is difficult to offer any decided recommendation.

62. That these vessels, which were built for an entirely different service, and are about 400 feet long, with a draught of 22 feet of water, and beam of nearly 50 feet, can pass through the canal is undeniable; but no practical seaman need be told, that in steering them through what may be called a continuous dock 90 miles in length, less than 100 feet wide, and with nothing showing above water to mark the centre of it, frequent grounding and consequent delay may be anticipated, though every possible care and precaution be taken. The extreme dimensions of these vessels, combined with the great height of their hulls, upon which the effect of even a moderate breeze in any other direction than right ahead must be very prejudicial to exact steerage, would increase the difficulty of the passage. It is to be considered, also, that the midship section of one of these vessels bears about an average proportion of 1 to 4 to a section of the deep water part of the canal; she would consequently displace about a quarter of the water in it, and, if moving above very slow speed, considerably reduce the depth of water underneath her.

63. As regards the advantages which the canal will offer to the national and commercial interests of the United Kingdom over the present route to the East by the Cape of Good Hope, two questions arise—the first, to what portions of the globe and to what class of vessels will it offer advantages; the second, what will be these advantages in point of time and money. The answer is, that India, China, and the Eastern Archipelago are the portions of the globe which will be specially affected; and to a certain extent Australia and New Zealand also; and that the class of vessels which will be exclusively benefited must be those with steam power, for the special reason that a part of the Mediterranean and the whole of the Red Sea, owing to the character of the winds, must be considered as essentially steam navigation. The class of steam vessels which have to be separately considered are—

1. Ships of war employed on the India and China Stations.
2. The Mercantile Marine.
3. The Troop Service between England and India, either as carried on by the present Indian transports, or by any vessels which may in future be designed.
4. The great lines of steamers carrying mails, passengers, and merchandize, such as the Peninsular and Oriental Company's vessels.

64. In considering these questions it is necessary to select some point as a standard of comparison in point of distance common both to India and China; that is, a point which vessels bound to either country must pass either near to, or in its meridian; and for the purpose we select Point de Galle.

	Geograph. Miles.
The distance from the English Channel (Start Point) to Galle by the canal is	6,515
By the usual sailing route round Cape of Good Hope it is	11,650
The difference in favour of the canal route is therefore	5,135

and this advantage may be considered as an equivalent, in point of time, to

36 days. A ship of war bound to India or China, by the present route, generally calls at the Cape de Verde Islands and the Cape of Good Hope, and in the case of China at Singapore, to replenish her fuel, &c.; by the canal, she would call, perhaps at Gibraltar, certainly at Malta, at Suez, and Aden, and if going to China, at Singapore, for the same purpose; and it may be safely assumed that she would use one-third more coals before reaching either station by the canal route, irrespective of the dues for passing through, which will be considered presently.

65. The mercantile marine may be considered under nearly the same conditions as ships of war, so far as the saving of time is concerned; but their condition being changed from sailing to steam vessels, the whole amount of fuel expended must be taken into account, as well as the loss of carrying power consequent on that change; the shortening of the voyage to China, however, by about 36 days, combined with the advantage of submarine telegraphy, will certainly far more than compensate for these drawbacks, and it is not to be doubted but that the canal route will prove highly advantageous to a class of vessels constructed especially for its navigation.

66. Under the present system of transport, 48 hours are occupied from the time of arrival at Alexandria to that of embarkation in the Red Sea, in carrying the troops by rail across the Isthmus of Suez, and it appears to us a reasonable calculation that by the canal route an average delay of 3 days might be expected, from the date of arrival of one of these ships on the Mediterranean side to that of her departure from Suez. Thus, then, it seems that, as regards time, the passage through the canal would not effect any saving, but if the adoption of that route, with a different construction of vessel, would lead to the reduction of one ship out of the five now employed, and abolish collateral expenses as well as the inconvenience of two transhipments of troops and baggage, it will certainly be worthy of consideration, and, leaving the political bearing out of the question, becomes a matter of expense only, which can easily be calculated.

67. The great lines of mail and passenger steamers, such as the Peninsular and Oriental, come nearly under the same conditions as the troop ships, except in the carrying of merchandise. They would probably land their mails and passengers at Bombay a day or two later by the canal route, than under existing arrangements, but they would save transhipment of cargo, and might possibly be able to reduce the number of their vessels; moreover, although the vessels of the Peninsular and Oriental Company are not precisely the class of vessel best adapted to navigate the canal, yet in this respect they enjoy a great advantage over the present Indian troop ships. The solution of the question as regards these companies is, that it will probably be found advantageous, at present, to adopt both the overland and the canal routes.

68. Any estimate of the comparative cost of the canal route and the overland transit, or the long sea-passage, must of course be based on the present tariff of charges adopted; in this respect no decisive information could be obtained on the spot, as to what they will ultimately be fixed at; probably because the Company's officers were unable to afford it. A doubt existed as to whether the dues would be charged on builders' measurement or register tonnage, which has since been decided in favour of the latter: it was uncertain also whether troops passing in ships of war would be considered as passengers. At the present time, however, there are three separate charges levied, viz.—

10 francs per ton, on register tonnage, or exclusive of space occupied by engines and coals.
10 francs a head for passengers.
20 francs per decimètre (4 inches) for vessels over 20-feet draught as a pilotage tonnage.

Therefore, the charges for one of the present Indian transports, taking the

register tonnage at 3002 tons, and drawing 20 feet, which she would probably do in passing through the canal, would be—

Registered tonnage	£1250
For 1200 troops, considered as passengers ..	480
Pilotage	50
Total	£1780

as against the present charge for overland transit, which is believed to be between 1600*l.* and 1700*l.*

For a vessel of the *Volage* class, the register tonnage of which is 852 tons, the charges would be—

Register tonnage	£355
Pilotage on 20 feet draught	50
Total	£405

69. Therefore, for a ship of war of the latter description and tonnage, adding 500*l.* for the extra coal which would probably be consumed, there would be 895*l.* to be placed against a saving of 30 days on the voyage to India or China, leaving out of consideration the wear and tear of a voyage round the Cape of Good Hope; taking these figures as a basis, it would probably be considered desirable to send all small or moderate sized vessels through the canal.

70. Keeping, then, in view what has already been said with regard to the physical character of the canal, and what has now been assumed as to its economy, the preponderance of opinion is against the use of the canal as a highway for our present type of transports; but it appears certain that by a different construction of vessel, and without any increase in the number, that object could be accomplished with ease and convenience.

71. This is an opinion which, of course, may prove fallacious. For the reasons assigned, however, it does not seem advisable that any change in the present system of moving troops between this country and India should be decided on before the commencement of the season of 1871; by that time there will be positive experience on which to base a decision, especially if the passage through of the *Jumna* should be determined upon; and if our anticipations prove correct in regard to the works still to be carried out, the canal will be in a far more perfect condition then than it is at present.

72. We have thus, in accordance with our instructions, considered in detail the present condition of the Suez Canal, and the works to be carried out in connection with it, as well as the probability of its being available for the purposes of Her Majesty's Naval and Transport Services, and have arrived at the conclusion—

1. That for a certain class of vessels, this great work, which must always be a monument of persevering energy and engineering skill, as it now stands, is a convenient mode of passage from the Mediterranean to the Red Sea.
2. That it will be so to a greater extent when the works contemplated, viz., the deepening of certain shallow parts, the enlargement of the *gares*, and the widening and improvement of the curves, are carried out.
3. That it is available for the transit of ships employed in the Eastern seas, with the exception of the large iron-clads, and other exceptionally heavy vessels.
4. That for the present type of Indian transports it is not a desirable route.
5. Further, we think that the cost of maintenance will not exceed the amount estimated for it when the work was first projected.

73. We would now briefly advert to the prospects of the canal as the grand highway for the naval and mercantile marine of Europe to the East. The real drawback to the canal is its narrowness; and we were informed that, except at the parts mentioned previously, it is not the intention of the Company to give it the additional width, the want of which alone prevents its being pronounced a complete success as a permanent navigable route for the largest ships from sea to sea.

Had its width at floor been doubled, with a proportional increase to its surface, it might now have been fairly regarded in that light, and its maintenance would have been comparatively easy, just as a great city thoroughfare is periodically renewed by having one-half of its width blocked up; whereas, by closing one-half of the canal as it now stands, the other would be rendered practically impassable to large ships, and some expedient must, therefore, be resorted to, such as carrying on the repairs by night, or leaving the passage open to ships for certain periods only during the day.

74. That to increase the width of the canal would be a perfectly feasible undertaking, the cost of which could be calculated with great accuracy, need scarcely be asserted; it is, however, we understand, very improbable that it will be undertaken by the present Company, and that it may eventually become a national or combined international engagement is a question which, depending as it must do on political and other considerations, it would be out of place to discuss here.

75. We cannot conclude this report without expressing the obligation we feel under to Mr. Guichard, the chief authority in the absence of M. Lesseps, and to every one of the officials of the Company with whom we came into contact, for the frank and unreserved way in which they placed all the information in their possession at our disposal.

We have great pleasure, also, in acknowledging the zealous and effective aid we received from Captain Nares, Mr. Tizard, the navigating lieutenant, and the other officers of her Majesty's surveying-vessel *Newport*, which vessel was placed at our disposal by their Lordships during the time we were employed on this service.

GEO. HENRY RICHARDS.
ANDR. CLARKE.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Issued August 15th, 1870.]

SESSION 1869-70.

Thirteenth Meeting (Anniversary), *May 23rd*, 1870.

Sir RODERICK I. MURCHISON, Bart., K.C.B., President, in the Chair.

The meeting being honoured by the attendance of His Majesty the King of the Belgians, the President received him as one of the Honorary Members of the Society, and addressed the meeting as follows:—

"Before the Secretary reads the minutes of the last Anniversary Meeting, I take the earliest opportunity of congratulating the Society on the auspicious fact, that on this day the good and enlighted King of the Belgians, an Honorary Associate of our body, has graciously come among us to take his seat and be admitted in person. We have the greater reason to rejoice in this gracious act when we know that, under His Majesty's auspices, a Geographical Society is forming in Belgium on the model of our own."

The President then admitted His Majesty according to the usual forms as a Member of the Society. His Majesty having remained till 2 o'clock, and having heard a portion of the Annual Address, expressed, before his departure, his gratification in belonging to so distinguished and useful a body.

The Byelaws relating to the Anniversary Meetings, and the Minutes of the last Annual Meeting, having been read, the President nominated, as Scrutineers of the Ballot about to take place, the Rev. J. Kennedy, M.A., and E. O. Tudor, Esq.

The Report of the Council for the year was read by the Secretary, C. R. Markham, Esq.

The following gentlemen were elected Fellows of the Society:—Edward G. Barr; Sir Edward Cunynghame, Bart.; Rev. R. J. Gould Colonel E. Y. W. Henderson; Lord Kenlis; Charles Lanyon; R. Prance; F. W. Raikes; George Wilks.

Before proceeding to deliver the Gold Medals of the year, the

PRESIDENT read to the Meeting the following official letter, which he had received from Lord Clarendon, Secretary of State for Foreign Affairs, in reply to his petition urging upon the Government to grant aid to Dr. Livingstone. He was sure they would all unite with him in returning the grateful thanks of the Society to Lord Clarendon and Her Majesty's Government for the communication.

"FOREIGN OFFICE, May 19, 1870.

"SIR,—I have lost no time in submitting to my colleagues your observations upon the position in which Dr. Livingstone is placed in consequence of his want of money, and Her Majesty's Government have not failed to consider all you have urged in favour of a further grant to the distinguished traveller, viz., that he has struggled without aid or communication with England for the last three years; that, by the last accounts, he had reached a point from which he can neither advance nor retreat without supplies; and that the money granted to him at his departure being exhausted, further funds are earnestly required to provide a fresh equipment, and the means of conveying it into the interior.

"I have now great pleasure in informing you that Her Majesty's Government are prepared to authorise a grant of 1000*l.* on account of Dr. Livingstone's expedition, in the earnest hope that the sum may be the means of promoting his return in safety to this country.

"I am, Sir, your most obedient humble Servant,

"CLARENDON."

Sir R. I. Murchison, Bart.

The PRESIDENT then delivered the Medals for the encouragement of Geographical Science and Discovery. The Founder's Medal to G. I. W. Hayward, for his journey across the Thian Shan to Yarkand and Kashgar, and for his Map of the route; the Patron's Medal to Lieutenant Francis Garnier, of the French Navy, for the part he took in Captain De Lagrée's journey of exploration from Cambodia to the Yang-tsze-Kiang, and for the skill and success with which he brought the expedition home after the death of his leader. Major-General Sir H. C. Rawlinson received the medal on behalf of Mr. Hayward; the Patron's Medal was received by Lieutenant Garnier in person.

The President next proceeded to deliver the Public Schools Medals to the successful competitors in the Geographical Examinations for the year conducted by the Society, first calling upon Mr. Francis Galton to explain to the meeting the results of the examinations for the present year.

Mr. GALTON said he had to announce that the Gold and Bronze Medals granted by the Council to the successful competitors in an examination confined to the chief Public Schools of the United Kingdom had this year been awarded as follows:—

PHYSICAL GEOGRAPHY—(Examiner, Alfred R. Wallace, Esq., F.R.G.S.):—*Gold Medal*—George Grey Butler, Liverpool College; *Bronze Medal*, Martin Stewart, Rossall School. *Honourably Mentioned*—William Hind, Cheltenham

College, and George Hughes, Liverpool Institute, equal; Frederick Joseph Beckley, King's School, Sherborne; Frederick William Hunt, University College School; Robert Frederick Whittingham Shawe, Cheltenham College; Ernest Chester Thomas, Manchester Grammar School. POLITICAL GEOGRAPHY—(Examiner, The Very Rev. the Dean of Chester):—*Gold Medal*, George William Gent, Rossall School. *Bronze Medal*, James Henry Collins, Liverpool College. *Honourably Mentioned*—Edward Crabb, Manchester Grammar School; William Grundy, Rossall School; George Hogben, University School, Nottingham; J. D. Murray, Clifton College; Harold Bailey Dixon, Westminster School.

Mr. Galton said he had further to add that the schools invited to compete for the present year were 43 in number, and that of these 19 accepted the invitation; the total number of boys competing being in Physical Geography 38, and in Political Geography 29. The examinations for next year (1871) would be held on the last Monday in March, the special subject being British North America, exclusive of the Arctic Regions.

The Medallists all received their medals from the hands of the President in person.

The annual Geographical Prize of 5*l.*, granted to the Society of Arts, to be awarded by them in their examinations, was afterwards presented to Mr. Critchett, of the Society of Arts, on behalf of the successful candidate, Mr. Thomas R. Clarke.

The medals and prizes having been presented, the President proceeded to read his Annual Address on the progress of geography; on the conclusion of which Admiral Sir George Back proposed, and Sir Charles Nicholson, Bart., seconded, a vote of thanks to Sir Roderick Murchison, for the learned and elaborate *resumé* of the geographical advances of the year which he had given.

Mr. THOMAS LEE pointed out a passage in the Society's Bye Laws, Chap. V., clause 3, to the effect that "No new regulation, nor alteration or repeal of any existing regulation, shall be made at such [anniversary] meeting, unless unanimously proposed by the Council," which appeared to him to be in contradiction to the terms of the Charter, which provide that all Byelaws should be made or altered by the Fellows at general meetings. On the arrangement entered into by Admiral Sir George Back to bring the subject before the Council, Mr. Lee did not propose any further action at the present meeting.

At the hour provided by the regulations, the Scrutineers announced the result of the Ballot, and the following were then declared elected as officers of the Society for the ensuing year, the names in italics being those of the new Councillors:—*President*: Sir Roderick Impey Murchison, Bart., K.C.B., F.R.S., &c. *Vice-Presidents*: *Sir H.*

Bartle Frere, K.C.B., G.C.S.I.; Francis Galton, Esq., M.A., F.R.S.; Major-General Sir Henry C. Rawlinson, K.C.B.; Major-General Sir A. Scott Waugh, F.R.S. *Trustees:* Lord Houghton, F.R.S.; Sir Walter C. Trevelyan, Bart. *Secretaries:* Clements R. Markham, Esq., F.S.A.; R. H. Major, Esq., F.S.A. *Foreign Secretary:* Cyril C. Graham, Esq. *Councillors: Admiral Sir George Back*, D.C.L., F.R.S.; Hon. George C. Brodrick; *George Campbell, Esq.*; Rear-Admiral R. Collinson, C.B.; James Fergusson, Esq., D.C.L., F.R.S.; A. G. Findlay, Esq.; Lieut.-Colonel J. A. Grant, C.S.I.; M. E. Grant-Duff, Esq., M.P.; *Vice-Admiral Sir W. H. Hall*, K.C.B., F.R.S.; *Professor T. H. Huxley*, F.R.S., &c.; Rear-Admiral E. A. Inglefield, F.R.S.; Captain Sir F. Leopold McClintock, R.N., F.R.S.; *Sir Charles Nicholson*, Bart., D.C.L.; *John Rae*, Esq., M.D.; Admiral George H. Richards, R.N., F.R.S.; Major-Gen. C. P. Rigby, C.B.; Arthur J. E. Russell, Esq., M.P.; *S. W. Silver*, Esq.; *Viscount Stratford de Redcliffe*, K.G.; His Grace the Duke of Wellington; Charles White, Esq., J.P. *Treasurer:* Reginald T. Cocks, Esq.

The Meeting then adjourned.

PRESENTATION

OF THE

ROYAL AWARDS.

(*At the Anniversary Meeting, May 23rd*, 1870.)

ROYAL MEDALS.

The Founder's Medal was awarded to Mr. George J. W. Hayward, the Society's Envoy to Central Asia, for the Map of his Journey across the Kuen Lun into Eastern Turkistan, and for the perseverance with which he is endeavouring to carry out his object of reaching the Pamir Steppe. The Patron's, or Victoria Medal, to Lieutenant Francis Garnier, of the French Navy, second in command of the French Exploring Expedition from Cambodia to the Yang-tsze-Kiang, for the part he took in the extensive Surveys executed by the Commission, for his Journey to Tali-fu, and for the ability with which, after the death of his chief, Captain de Lagrée, he brought the Expedition in safety to Hankow.

In presenting the Medal to Major-General Sir H. C. Rawlinson, on behalf of Mr. Hayward, the President spoke as follows:—

"The Founder's Medal for the year 1870, has been awarded to Mr. G. J. W. Hayward, late of H.M. 72nd Regiment, for the valuable services he has already rendered to Science in improving our acquaintance with the Geography of Central Asia; and also in acknowledgment of his zeal and energy in entering at the present time on another perilous expedition for the same purpose. Mr. Hayward having proposed, in 1868, to proceed as a private traveller on an exploring journey into Central Asia, if the Royal Geographical Society would provide him with instruments and contribute to the expenses of the expedition, such assistance was readily afforded: and the Society has every reason to be satisfied with the results of the Journey, which was thus undertaken under their auspices and with their encouragement. The countries to which Mr. Hayward's attention was particularly directed were the plains of Eastern

Turkistan on the one side, and the contiguous Pamir Plateau on the other; the hydrography of the Upper Oxus, of which our knowledge is very imperfect, being considered an object of especial interest. It was recommended to endeavour to penetrate from the Cabul River by the Valley of Chitral to the head streams of the Oxus, and from thence to pass over the Pamir Steppes to the cities of Yarkand and Kashgar; but if this route, which has never yet, it is believed, been followed by a European traveller, proved impracticable, he was authorised to pursue the easier line by Cashmir and Little Tibet. Finding, accordingly, on his arrival at Peshawar, that the tribes to the north-west were in arms, and that the mountain-passes were entirely closed, he proceeded direct to Leh, the capital of Ladak, and from thence took the high road to Yarkand. Here his geographical researches and discoveries commenced. He tracked the upper courses both of the Karakash (or Khoten) and Yarkand rivers, and rectified important errors in the official maps; and he pointed out the immense importance of securing the Yangi Davan Pass, beyond the Yarkand River, against the inroads of the Kunjút robbers, as the only road across the Kuen Lun which was practicable to laden horses or mules. Subsequently Mr. Hayward pursued his journey to the cities of Yarkand and Kashgar, taking observations for latitude at almost every stage, and, by careful measurements of distance and a continuous series of angles, determining with very considerable accuracy the longitudes also of all the principal stations. The map of Eastern Turkistan, which Mr. Hayward forwarded to the Geographical Society on his return to India, is a most creditable and valuable document. It has already received high commendations both from the Government and the Survey authorities in India, and as it will be published in the Society's 'Journal,' together with the elaborate Memoir with which it was accompanied, it will soon be available for general reference.

"The Council of the Royal Geographical Society, as a scientific body, can take cognizance officially only of geographical services; and it is expressly on this ground that they have awarded the Founder's Medal for the present year to Mr. Hayward; but they cannot lose sight of the fact that the travels of Messrs. Hayward and Shaw have been at least as valuable in a public as in a scientific point of view. They have removed causes of distrust and alarm which gave rise to disquietude in India; they have opened out a new field to British trade and enterprise; they have laid the founda-

tion of what may prove in the sequel to be a valuable political alliance.

"With regard to Mr. Hayward's present position, nothing positive can be announced. All that is known is this, that being stimulated rather than disheartened by his failure to reach the Pamir Plateau from Turkistan (the Kashgar authorities having placed an absolute interdict on his proposal to return to India by Badakhshan and Chitral) he had no sooner recruited his strength by a few months' rest on the Indian frontier, than he resolved to make another attempt to carry out his original design. Assisted, accordingly, by a further supply of funds from the Geographical Society, and having obtained the good wishes and support of his Highness the Maharajah of Cashmir, he started towards the close of the year for the valley of Gilgit, which is now held by his Highness's troops. He intended to winter in Gilgit or some of the adjoining valleys, and to endeavour in the early spring, or as soon as the passes were open, to push his way across the mountains to Badakhshan and the Upper Oxus. From thence the road would be open to Pamir, and he hoped, after thoroughly examining the hydrography of the Upper Oxus, to cross into the Russian territory of Samarkand, where, at the instance of the President of this Society, instructions have been sent from St. Petersburg to receive him with kindness and hospitality, and facilitate his return to England. In the course of the next few weeks, it is probable that something definite will be learnt as to his present and prospective movements."

Sir HENRY C. RAWLINSON, having received the Medal, spoke as follows:—

"I feel an especial pride and satisfaction in receiving on behalf of Mr. Hayward this day, at your hands, the Patron's Gold Medal of the Royal Geographical Society. I feel a pride because it was my good fortune to introduce Mr. Hayward in the first instance to the notice of the Society, and I feel a satisfaction because I know that Mr. Hayward has fairly earned the distinction which has been conferred upon him, and because I also foresee that his successful example will stimulate many other travellers to similar exertions in the cause of science. Perhaps it may not be out of place if, in a very few words, I briefly state how Mr. Hayward has come to gain the Medal of the Society, and in how far I was instrumental in sending this promising explorer on his travels. For the last thirty years I have taken a great interest in the geography of Central Asia, and

have striven to encourage and promote discovery in those regions. Personally I was unacquainted with Mr. Hayward until a very few years ago, when, on his return from India, he waited on me one day at the India Office, and stated that having retired from the army, and being desirous of active employment, he proposed to undertake any exploratory expedition that I could suggest. He added that he had some experience in such travels, that he was a fair surveyor and draughtsman, and that he was ready, in fact, to proceed on any expedition that I could recommend. I at once suggested to him that the cities of Eastern Turkistan and the Pamir Steppes were regions of great interest with which we were comparatively unacquainted. They were of interest, I told him, not only geographically but commercially and politically. He readily fell in with the suggestion, and offered to proceed by the next mail to India, provided, as he was not in affluent circumstances, the Geographical Society would contribute something to the expenses of the expedition. That contribution was at once accorded, thanks to the liberality of the Council, and he left by the next mail for India. You have already explained, Sir, how on his arrival in the Punjaub, he found the passes into Tartary by the Chitral and Bajore valleys to the west, which a European had never threaded, to be impassable, owing to disturbances among the mountain tribes, and was thus compelled to abandon his first project; but nothing daunted by this failure, he soon struck out another line further east, and in due course, in company with Mr. Shaw, he reached the cities of Yarkand and Kashgar, which had never before been visited by an Englishman. I will notice one great disadvantage under which he laboured, a disadvantage which I think it is infinitely to his credit that he was able to overcome. He travelled as a mere private gentleman; he was not officially recognized by the Government; he had no profession, no occupation. Now, a private traveller, although that character is perfectly understood in Europe and in Western Asia, is quite unintelligible to the suspicious inhabitants of Central Asia. They regard every one who is not an avowed servant of the Government, or a merchant, or a doctor, as necessarily a spy; they cannot appreciate the desire we have to obtain new geographical information, and, therefore, I think it does greatly redound to Mr. Hayward's credit, and testifies to his tact, temper, and diplomatic skill, that he was able to disarm suspicion, and not only to reach the cities of Kashgar and Yarkand, but to return in safety, and bring back such ample and correct

materials with regard to the physical features of all the country between the British dependencies on the one side and the Russian dependencies on the other. I can add nothing, Sir, to what you have already stated as to Mr. Hayward's present position and prospects; but of one thing I am assured, and that is that the same indomitable will, the same fertility of expedient, the same disregard of dangers and hardships, the same iron constitution and great bodily activity, which carried him successfully through the snowy passes of the Karakorum and Kuen Lun, will stand him in good stead in his present still more hazardous undertaking; and that if any Englishman can reach the Pamir Steppe, and settle the geography of that mysterious region, the site of the famous Mount Méru of the Hindoos, and the primeval paradise of the Aryan nations, Mr. Hayward is the man. Sir, with such a hope, I gladly accept this medal on Mr. Hayward's behalf; I accept it as the reward of daring and enterprise, combined with skill, accomplishments, and intelligence, and knowing as I do Mr. Hayward's ardent and impressible nature, I feel assured that he will receive the medal as an ample return for his labours in the past, and as a happy augury of his success in the future."

The President then addressed Lieutenant Francis Garnier, of the French Navy, the recipient of the Victoria Medal:—

"The Patron's or Victoria Gold Medal of the Royal Geographical Society is presented to you, Sir, as the accomplished and intrepid traveller who accompanied, as second in command, the late Captain de Lagrée on the great expedition of exploration from the French territory in Cochin China, along the Mekong River, and through the heart of China, to the Yang-tsze-Kiang. In the course of this expedition, from Cratieh in Cambodia to Shanghai, 5392 miles were travelled over, and of these, 3625 miles, chiefly of country almost unknown to us, were surveyed with care, and the positions fixed by astronomical observations.

"In carrying out this important and truly scientific mission, your commander succumbed to the fatigues and privations of the harassing march between the head-waters of the Mekong and Tong-chuan, in the centre of Yunan. Through his illness the progress of the undertaking was for a time arrested, for one of the chief objects—a visit to Tali-fu, the head-quarters of the formidable Mahomedan insurrection against the Chinese authorities—seemed little likely to be realised. But you, Sir, nobly volunteered to undertake this

hazardous journey, and your commander having consented, you made a rapid march to the rebel stronghold, satisfactorily fixed its geographical position, and escaping a threatened attack by the jealous inhabitants of the place, returned in safety to the capital of Yunan, where, alas! you found your chief had died in your absence. Disinterring his remains for conveyance to your native country, you crossed to the nearest port on the Yang-tsze, and embarking in a native boat, you brought the remainder of your party in safety to the mouth of the river.

"In my Address of last year, I spoke, M. Garnier, of the most remarkable explorations of yourself and your associates, as having developed not only the true physical geography of vast tracts hitherto undescribed, but also in having contributed much fresh knowledge respecting the philology, antiquities, zoology, botany, and geology of these regions. I then also said, that you and your associates had traversed a greater amount of new country than, according to my belief, had been accomplished for many years by any travellers in Asia, and I confidently anticipated that our Council would at this Anniversary award you our highest honour. In short, as France has the fullest right to be proud of these doings of her gallant naval officers, so on my part I can assure you, M. Garnier, that every English traveller and geographer rejoices in seeing you honoured with the medal which bears the likeness of our beloved Queen Victoria. It gratifies me to learn that the great work descriptive of your remarkable explorations is about to be published, under the auspices of the Imperial Government; and I shall be delighted to learn that your enlightened Emperor should reward you by promotion to a higher rank in the French Navy."

M. GARNIER replied as follows:—

"Messieurs,—Je regrette vivement de ne pas connaître assez la langue anglaise pour adresser dans cette langue mes remerciements à la Société de Géographie d'Angleterre. Je ne fais sans doute que recueillir l'héritage scientifique du noble officier dont j'étais le second, et qui, après avoir mené à bonne fin un long et périlleux voyage, a malheureusement succombé au port. Permettez-moi donc de rapporter à la mémoire du Commandant de Lagrée tous vos glorieux suffrages.

"Ne dois-je pas rappeler aussi que c'est à l'initiative anglaise qu'ont été dues les premières tentatives faites pour pénétrer de l'Inde

en Chine, et qu'il y a plus de trente ans le lieutenant MacLeod reconnaissait un point du Mekong situé presque aux frontières de ce dernier empire. Sur quelque partie du globe que l'on se trouve, au seuil de toutes les contrées inconnues, ne sont-ce pas presque toujours des voyageurs anglais qui s'avancent, qui s'exposent pour étendre le cercle des connaissances géographiques?

Cette conquête scientifique du globe est la seule qui doive exciter aujourd'hui l'émulation des peuples. Le monde appartient à qui l'étudie et le connait le mieux; et comme Français, je ne puis m'empêcher d'envier à l'Angleterre et de souhaiter à mon pays, cette ardeur de découvertes, ce besoin d'expansion qui fait flotter le pavillon britannique sur tous les rivages, et a fait de son commerce le premier commerce du monde. La noble récompense que décerne aujourd'hui à un Français la Société de Géographie de Londres, prouve que votre pays, Messieurs, sera le premier à applaudir et à encourager les efforts qui auront pour mobile le progrès des sciences et l'appel à la civilisation des régions restées jusqu'à présent en dehors du mouvement général. C'est là le plus grand des devoirs qui incombent aux nations civilisées; c'est dans son accomplissement qu'il y a le plus de gloire à recueillir, et cette gloire la Société de Géographie d'Angleterre se l'est acquise entre toutes, par la féconde et puissante impulsion qu'elle a su imprimer aux recherches géographiques."

The President then presented the medals awarded to the successful competitors in the geographical examination of the year, held, at the invitation of the Society, at the chief Public Schools. The names of the medallists were:—In Physical Geography, Gold Medal, Mr. George Grey Butler, of Liverpool College; Bronze Medal, Mr. Martin Stewart, of Rossall School. In Political Geography, Gold Medal, Mr. George William Gent, of Rossall School; Bronze Medal, Mr. James Henry Collins, of Liverpool College. The young men having been introduced by Mr. Galton, the President thus spoke:—

"In presenting these Medals, I may remind the Meeting that this act on the part of the Society, which was decided on by our Council at the suggestion of Mr. Francis Galton, is now brought into operation for the second time. The working of this system is due to two Members of the Council, Mr. Francis Galton and Mr. George Brodrick, and the awards are made by two eminent men of science and letters, Mr. Alfred R. Wallace and the Very Rev. Dr. Howson,

Dean of Chester. It is needless for me to indicate that every young reader of classical history must infinitely better understand his subject if the proper boundaries and political geography of ancient kingdoms are brought to his mind's eye in maps. Again an acquaintance with physical geography is an essential part of the instruction of every well-educated person. It is to these two classes of our subject that we assign medals of different values, according to the Report of the Examiners, two of bronze and two of gold. On this point I have to observe that those who have gained medals this year were all competitors for such distinctions last year, as will be seen by the Report of the Examination when published. On this occasion, as at the last Anniversary, the chief honours have been won by educational establishments in Lancashire, viz., the Liverpool College and Rossall School.

"It is much to be regretted that at present the leading public schools, Eton, Harrow, and Rugby, have not as yet competed for these juvenile honours; but I feel confident that they will ere long prepare youths who will pass with credit through the ordeal of our Examiners.

"On this occasion the Gold Medal for Physical Geography has been won by Mr. George Grey Butler, to whom I now deliver the Prize, adding these observations on my own part. That it is a hopeful sign of the reform in modern education to find that a representative of the name of Butler, a family which has gained so many successes at the Universities in purely classical studies, which has contributed two Head Masters to Harrow and two to other great public schools, should have competed for and won our Gold Medal for Physical Geography. I congratulate you, Mr. Butler, on being the worthy recipient of this distinction. Lastly, when I turn to the subject of Political Geography, I am much gratified to present to you, Mr. George William Gent, the Gold Medal for this important branch of knowledge, for I am happy to remind the Assembly that you gained the Bronze Medal last year for Physical Geography."

The annual prize of five pounds for proficiency in geography, granted to the Society of Arts for the examination held under their direction, was afterwards handed by the President to Mr. Critchett, on behalf of the successful candidate, Mr. Thomas Richard Clarke.

ADDRESS

TO

THE ROYAL GEOGRAPHICAL SOCIETY.

Delivered at the Anniversary Meeting on the 23rd May, 1870.

By Sir Roderick Impey Murchison, Bart., K.C.B.,
President.

Gentlemen,

I address you once more in this Theatre of the Royal Institution, which, by the kind consideration of its President and managers, has been placed at our disposal. In expressing my thanks for the use of it, I am glad to say that our meetings have been frequented by many members of that distinguished body, and that thus a mutual good feeling has been established, in which I rejoice, as it was in this building that I acquired my earliest scientific knowledge, as taught by Davy, Brand, and Faraday.

I have so fully explained our position, as to the acquisition of a separate local habitation and hall of our own, in the opening of my last Address, that I have only now to add that, by the authority of the Council, I have made a strong written appeal to the Prime Minister, to grant to us apartments similar to those given to six other Societies, but as yet have received no reply.

The numbers of our Society have steadily increased; they amount now to 2263 Fellows, exclusive of 74 Honorary Members, and our warmest thanks are due, as in former years, to our Assistant-Secretary and Editor, Mr. H. W. Bates, for having laid before us the annual volume of our 'Journal' again so much earlier than it used formerly to appear; with regard to the contents of this volume, I shall have to make some remarks in the course of this Address.

OBITUARY.

Captain Charles Sturt.—I commence the melancholy record of our losses, by a notice of one of the most distinguished explorers

and geographers of our age, as prepared by my friend Mr. George MacLeay, simply adding, on my own part, that I heartily applaud every expression in this just tribute.

Of the many hardy and energetic men, to whose bravery and intelligence we owe our knowledge of the interior of Australia, Charles Sturt is perhaps the most eminent. To him we are indebted for the discovery of the great western water-system of that vast island, between the 25th and 35th parallels of latitude, and 138° and 148° of longitude; a discovery which not only speedily led to the occupation of enormous tracts of valuable pasture country in New South Wales, but very shortly resulted in the settlement of the magnificent gold-producing colony of Victoria and its not much less successful neighbour the colony of South Australia. To him we are also indebted for the solution of the great geographical problem, the true character of the Eastern Interior of Australia, which, until he undertook his third expedition in 1844, was, by the colonists at large, as well as by many geographers, believed to be the receptacle of all the western waters, and to consist of one huge inland sea. And, further, to Sturt's instructive example we owe the series of distinguished explorers, such as Eyre, McDougall Stuart, and others, who have since so worthily and successfully trodden in his footsteps.

Charles Sturt, the eldest son of Thomas Napier Lennox Sturt, of the Bengal Civil Service, and grandson of Humphry Sturt, of More-Critchill, Dorsetshire, was born in India in 1796. After receiving his education at Harrow, he obtained a commission in the 39th Regiment, and served with it in America, France, and Ireland.

In 1827 he accompanied the 39th to New South Wales, and very shortly after his arrival in Sydney, though holding a high staff appointment, he volunteered to lead an expedition of discovery into the interior. At that time one of those droughts, which periodically afflict Australia, was at its very worst; and in the ignorance which prevailed as to the nature of the back country, of which nothing was known beyond Oxley's investigation, the deepest anxiety was felt with respect to the pent-up and struggling colony. The then Governor, General Darling, was but too glad to avail himself of the proffered services of the young soldier, and, accordingly, a well appointed party, under Sturt's command, was soon prepared and sent off. Following Oxley's track down the Macquarie, Sturt was more successful than that officer, owing to the very dry season, in

turning the marshes in which the river becomes lost; and shortly after, having struck upon the Castlereagh, he followed the course of that stream down to its junction with the noble river—until then unheard of—to which he gave the name of the "Darling." This river, though draining an immense extent of country, was at this time, in consequence of the extraordinary drought which prevailed, very low, and, owing to strong local brine-springs, its water was found to be utterly unfit for use. Sturt was thus compelled for the time to relinquish all further investigation and to return to head-quarters. Conceiving, from the course the Darling was taking at the two different points at which he had touched upon it, that it would eventually be found to unite with the waters of the Lachlan, and the fine never-failing mountain-stream the Morumbidgee, and so form too large a body of water to be absorbed in swamps, he obtained leave in the following year to pursue the course of this last most promising river, and thus to test the accuracy of his theory. His party, on this occasion, consisted of a friend, two soldiers, and eight convicts, specially selected for the service. Running down the Morumbidgee for some weeks, the party came on the junction of the Lachlan, which was found to have re-united its waters beyond Oxley's supposed inland-sea; and in a few days after, having taken to a boat, which had been carried in frame, the party, now reduced to eight, were launched on the wide bosom of that magnificent river, to which Sturt gave the name of the "Murray." Ten days subsequently, after encountering some difficulty from the navigation, and very great peril from the aborigines, who were found all along the banks in great numbers, and who had never seen or heard of a white man before, they came on the mouth of the Darling, which had maintained a pretty direct course from the spot where Sturt had left it some 400 miles to the north-east,—a fact most satisfactorily verifying his prediction. Sixteen days later, after much toil, tugging at the oars from morning till night, the party came upon the great lacustrine expanse—half fresh, half salt—named by Sturt "Lake Alexandrina," the surplus waters of which find vent through narrow channels into Encounter Bay. Not being able to launch their boat through the surf which they found rolling into the bay, there was nothing left for the party but to work their way back up the very streams which they had found it laborious enough to descend, and this they had to do on a very straitened allowance of food; their supplies, indeed, altogether failed them for some days before they reached

the teams which had been sent from Sydney to meet them. The sufferings of the party on their return were very great. Sturt never afterwards had good health, his eye-sight, in particular, becoming very seriously affected. But a great success had been achieved, which to the present day is spoken of in the colony with very great and natural pride.

After some years' employment in the public service in South Australia, the settlement of which followed very closely upon his discovery, and of which colony he was regarded as the "Father," Sturt, in 1844, volunteered another expedition, and undertook to penetrate the very centre of the "Island-Continent." This expedition was unfortunate enough. Its failure, however, was in no way to be attributed to any deterioration in the qualities of its leader. The season was one of severe drought, and, by a strange fatality, always hitting upon the most barren strips of country for his route, he again and again found himself in a hopeless desert, which it was utterly impossible to get through. A line taken a degree or so to the east in a far more favourable season, however, enabled Burke and Wills—though at the expense of their lives—and also his own Lieutenant, McDougall Stuart, to pass through the very centre of the land, and so to reach the Gulf of Carpentaria. This great achievement, the grand object of his ambition, was thus vexatiously lost to him, who would have been deemed by all the most worthy of the honour: but no man more warmly expressed his appreciation of the labours and deserts of those who subsequently succeeded in this wonderful feat than Sturt. Even as it was, his discovery of the Barcoo, or Cooper's Creek, led in no small degree to the success of those who, in more genial and suitable seasons, followed in his path. Being overtaken by the great heats of summer, in the neighbourhood of this last-named watercourse, and knowing that they should not be able to find any other water for hundreds of miles on their route homewards, Sturt's party excavated a cell under the ground, in which they had to pass six most miserable summer months; being thus compelled, in order to mitigate the frightful heat, to adopt a course analogous to that made use of in winter by Arctic voyagers to escape the effects of extreme cold.

Sturt has published narratives of these several expeditions, remarkable for succinctness, modesty, and general intelligence.

Calm and collected, this brave man never failed to inspire perfect confidence in his followers, while he secured their love and respect

by his unvarying courtesy and consideration, and the cheerful happy way in which he always met the difficulties and privations which necessarily attend such expeditions. Like all brave men, Sturt was most kind-hearted, and compassionate almost as a woman. Though frequently receiving extreme provocation, he never permitted the aborigines to be treated otherwise than with most humane forbearance. He might have boasted, had he been a man to have boasted of anything, that not one single drop of blood had been shed on any one of his expeditions. Owing to the hardships and exposure he had undergone, his constitution (which naturally was very strong), after the last expedition, completely broke down, while he became all but blind; a state of things which, of course, necessitated his retirement from public life. Some years ago he returned with his family to England, to live on the liberal pension awarded him by his favourite colony, the people of which reciprocated his kindly feelings, and always delighted to do him honour.

Modest and unassuming, he lived here among us in complete retirement, never courting notice, and certainly never seeking distinction of any kind. Yet surely such a man, when others without half his merit were receiving honours from the State, ought to have been sought out at an early period for public recognition! For a quarter of a century he was quite neglected. It was reserved for that kind-hearted nobleman, Earl Granville—when the Order of St. Michael and St. George was remodelled—at length to show proper appreciation of his deserts; and he received notice from his Lordship, in May last, that he was to be included in the list, then about to be published, of the Knights Commanders of that Order. Before, however, the 'Gazette' appeared, Sturt had breathed his last.

On the 16th of June this kind, gentle, modest, and brave man started on his last journey. No traveller, so bound, could have entered on it under happier or more promising auspices.

Right Hon. Henry Unwin Addington.—By the decease of this excellent man, in his 80th year, the Crown and country have lost one who was long a most able and conscientious diplomatist and public servant. He began his career in the Foreign Office in 1807, and already in 1808 we find him serving as an Attaché to Lord Amherst's Mission to the Court of Naples and Sicily. Having been attached to the Missions at Stockholm, Switzerland, Denmark, and Washington, and having negotiated on two occasions between Spain and her Colonies, he was promoted to be the British Minister at

Frankfort, and afterwards held the same office at Madrid. He was twice employed as a negotiator between this country and the United States. Eventually, after all these services, he became Under-Secretary of State for Foreign Affairs in 1842, and continued in that important office for 12 years, when, on retiring in 1854, he was created a Privy Councillor.

In his varied journeys and missions Mr. Addington witnessed many remarkable scenes. Thus, when attached to Sir Edmund Thornton, at Berlin, in 1813, he was present at the capture of Leipsic by the Allied Forces, and, on entering that city with the suite of Prince Blucher, he saw the meeting of the Allied Sovereigns in the great square of that city. Subsequently he was attached to the head-quarters of General Bernadotte, then adopted as Crown Prince of Sweden.

In his last mission to Madrid he served from the autumn of 1830, during the eventful period which witnessed the abolition of the Salic Law in Spain and the succession of Queen Isabella to the throne, on the death of her father, Ferdinand VII.

As Under-Secretary of State his services were thoroughly and warmly appreciated by Lords Aberdeen, Palmerston, and indeed by every one connected with the Foreign Office, and by no one more so than by his distinguished successor the Right Hon. Edmund Hammond, to whom I am indebted for some of the above details.

For the last 10 years of his life Mr. Addington was a very constant attendant at our meetings, serving with great efficiency as one of our Council; for he was by study, as well as keen observation, an accomplished geographer.

Among the traits of character which won for him the attachment of his friends, I may here mention that, in preparing my obituary sketch of Lord Palmerston in 1866,* I was indebted to Mr. Addington for a just delineation of the leading official attributes and habits of that lamented statesman.

As a proof of his manly sincerity and loyalty, I may state that, when my valued friend, our Associate Ex-Governor Eyre, was prosecuted through what I considered to be a misdirected and unjust movement of certain persons, Mr. Addington sent to myself, as the Chairman of the Eyre Defence Fund, a sum of 50*l.*, and added personally, when bewailing the fate of the Governor of Jamaica, "If my uncle, the late Lord Sidmouth, had been Minister at

* See 'Journal of the Royal Geographical Society,' vol. xxxvi.

the time, he would at once have sent to Governor Eyre some mark of honour from the Crown, for having saved a British Colony from insurrection and ruin."

Lord Broughton, G.C.B. This highly accomplished nobleman, who died in his eighty-fourth year, on the 3rd June last, lived a most eventful life. He was also, as will be explained, one of the founders of the Royal Geographical Society. Educated at Westminster School, and afterwards at the University of Cambridge, he was there associated with Byron, and other young men destined to rise to great distinction. In 1809 and 1810 he was the companion of Lord Byron in his travels through Albania and other parts of Turkey, as well as Greece. He published his well-known work, entitled 'A Journey through Albania and other Provinces of Turkey in Europe and Asia,' before he had entered upon public life, in 1813; but he improved and brought it out again in his maturer age, and when he had attained the dignity of the peerage (1855). Few works of travel have obtained a more lasting reputation; inasmuch as it is justly and equally prized by the scholar, the antiquary, and the geographer.

As the eldest son of Sir Benjamin Hobhouse, Bart., he succeeded to the baronetcy in 1812, and was the colleague of Sir Francis Burdett in the representation of Westminster from 1820 to 1833. It was during that period that I formed an acquaintance with him, which ripened into friendship. Thus it was that, in the years 1831-2, I followed the chase in Leicestershire with him and Sir Francis, just before I embarked on a scientific career. Beginning to reside in London in 1823, I became a member of the Raleigh Club of real travellers, of which Sir John Hobhouse was a member and a pretty constant attendant; and it was at that club (since converted, on my suggestion, into the Geographical Club), in 1828, that the origin of the Royal Geographical Society was broached, and in 1829 made its real start. At that time Sir John Barrow was the President of the Raleigh Club; and he, with several others, all of them except myself being now dead, held meetings at the Admiralty, and there drew out the Resolutions on which the Society was afterwards established, at a public meeting in 1830, under the Presidency of the Earl of Ripon. I have always regretted that this preamble, which I now offer, was not inserted in the first volume of our Journal.

The persons, then, who really founded the Society were Sir John Barrow; Sir John Cam Hobhouse; Robert Brown, the Prince of botanists; the Honourable Mountstuart Elphinstone; Mr. Bartle

Frere; and myself. And of these no one was more active than Sir John Hobhouse.

In a long and successful public career, as Sir John Hobhouse, he filled successively the offices of Secretary for Ireland, Chief Commissioner of Woods and Forests, and President of the Board of Control. In this last and most important station, his administration was marked by great vigour, during several of those crises which affect at intervals our Indian empire. For his long services he first received the Grand Cross of the Bath, and subsequently was advanced to the Peerage in 1851.

During the latter portion of his life, Lord Broughton resided much in Wiltshire, and was there, as in earlier days in Leicestershire, a keen fox-hunter. Even when he had passed his seventy-fourth year, I have seen him ride with a loose rein down the steep slopes of the downs, near Tedworth House, his last country residence, where many of his old friends enjoyed, as in Berkeley Square, his true hospitality and ready wit, enlivened by the presence of his charming daughters, the Hon. Mrs. Dudley Carleton and the Hon. Mrs. Strange Jocelyn.

Admiral of the Fleet Sir WILLIAM BOWLES, K.C.B.—This well-known officer was born in 1780, and entered the Navy on board the *Theseus*, 74, in September, 1796; and after serving in six different ships of war, on many stations, with much credit to himself, he obtained the rank of Lieutenant as early as 1803, and subsequently that of Commander in 1806.

Being appointed to the *Zebra* (bomb), stationed in the North Sea, he saw some service, and was frequently engaged with the Danish batteries and flotilla. Having been shortly promoted to the envied rank of Post-Captain, followed by a series of commands, Captain Bowles, then in the *Medusa* frigate, co-operated with the Spanish forces, under General Porlier, and contributed to the destruction of nearly all the batteries between San Sebastian and Santander; and in the following July, "particularly distinguished himself by his zeal, ability, and activity, as second in command of the Naval Brigade, in a successful engagement with a strong detachment of the enemy's troops near Santona." In 1811 this indefatigable officer, ever on the alert where work was to be done, being again in the Baltic, in the *Aquilon*, 32 guns, completely destroyed "seven large merchant-ships, in the face of 1500 French soldiers."

He was then employed for several years on the South American station, latterly as Commodore in the *Asphion* and *Creole* frigates;

and from his great attention to the interests of British commerce, received, on one occasion, "a complimentary address, and, subsequently, a piece of plate, from the mercantile representatives of Buenos Ayres."

Besides other commands, in 1822 Captain Bowles was appointed Comptroller-General of the Coast-guard, and was universally esteemed by that force for his courteous demeanour, impartiality, and strict regard to discipline. He retained it, with much advantage to the service, till November, 1841, when he attained flag rank. In May, 1843, he was selected for the purpose of conducting a particular service, and hoisted his flag on board the *Tyne*, 26, at Queenstown, but in a short time shifted it to the *Caledonia*, 120 guns, where he remained till May, 1844. He became Admiral in 1857, and afterwards was Commander-in-Chief at Portsmouth.

The well-known administrative qualities of Admiral Bowles gained for him, on two occasions, the position of a Lord of the Admiralty, and in after years he was often selected to preside over difficult and delicate enquiries requiring equal discrimination and judgment. He married, 9th August, 1820, the Honourable Frances Temple, sister of the late Lord Palmerston, but became a widower in 1838. He represented Launceston in Parliament, was created a K.C.B., and ultimately was raised to the highest rank in his profession, Admiral of the Fleet.

Sir William Bowles was for thirty-seven years a Fellow of this Society, and took the deepest interest in promoting its objects, either by aiding in the organisation of one of the Land Arctic Expeditions, or in numerous other ways of a substantial description.

Naturally benevolent, his name was greatly respected by the many institutions over which he presided, especially those of the "Sailors' Home," in Wells Street, and the "Seamen's Hospital" (the *Dreadnought*). In short, wherever the claims of the distressed mariner were advocated, he was ever ready with his pen and his purse to assist. In a brief memoir of this nature it is unnecessary to enumerate the many charitable societies to which he contributed; but it would be unpardonable to omit the Royal Naval Female School, for whose welfare he manifested an unwearied earnestness, as well as that useful establishment, the Royal Naval School at New Cross, which may be aptly termed a nursery for sailors. For upwards of twenty-one years he was the vigilant President of its Council; and, in addition to other bounties, he generously gave 1000*l.* to the fund for its chapel.

Still in the enjoyment of health, and an almost unimpaired memory, an accidental fall caused his death, at the ripe age of eighty-nine; and it may be truly said that few men have left a more estimable name than the good Admiral Bowles.

I owe this truthful sketch to my valued friend, Admiral Sir George Back.

M. ADRIEN BERBRUGGER, one of our Honorary Corresponding Members, died at Algiers on the 2nd of July last, in his 68th year. He was known chiefly for his great special knowledge of the Archæology of Northern Africa, where he resided during the greater part of his life, and where he wrote his 'Algérie historique, pittoresque et monumentale,' his 'Grande Kabylie sous les Romains,' and other works. He was President of the Historical Society of Algiers, and had been a member of all the various scientific commissions appointed for special investigation in the French colony during the past thirty years.

Mr. J. W. S. WYLLIE, a gentleman who had gained distinction in the public service of India, and whose future career seemed full of promise, died on the 17th of March last, at the early age of 35 years. He was the son of General Sir William Wyllie, and was born in India in 1835. After completing his education in England, first at Cheltenham, and afterwards at Trinity College, Oxford, he returned to India, and was one of the first men appointed to the Civil Service of our great Eastern Empire by public competition. He served throughout the Mutiny in the Bombay Presidency, but was transferred in 1860 to the Presidency of Bengal, where he acted successively as private secretary to the Commissioner of Oude, Under-Secretary to the Government of India, and Secretary for Foreign Affairs. He entertained decided views regarding the Foreign Policy of our Indian Government, and, since he quitted the service, advocated the principle of non-interference in the affairs of states and tribes beyond our frontiers, with great force and eloquence, in various articles contributed to the leading reviews, to one of which I had occasion to refer in my Address of 1868.* Mr. Wyllie returned finally to England in 1868, and, in the General Election of December of that year, was returned to Parliament as Member for Hereford. He was enrolled in the same year as Fellow of this Society, and, shortly before his untimely decease, had taken part in the discussion at one of our evening Meetings.

* 'Journal of the Royal Geographical Society,' vol. 38, p. clxxvi.

The Earl of DERBY, K.G.—This great statesman and brilliant orator, who died on the 23rd October, 1869, had been a Fellow of our Society since 1833. Educated at Eton and Oxford, he entered Parliament at the age of 21, and thenceforward pursued that most remarkable career by which he has been distinguished. Previous to his official life he was a zealous traveller in India and the United States, and so far we claim him as a Geographer.

It would be presumptuous on my part to attempt to sketch even the outlines of the political life of Lord Derby; but I may state that, whilst he represented one of the most ancient of our noble families, he was one of the most distinguished classical scholars of our age. As such he was most appropriately elected Chancellor of the University of Oxford; and I shall ever consider it one of the greatest honours I have received in life that, upon his installation in that Office, he was pleased to select me as one of those persons worthy of being admitted to the Degree of Doctor of Civil Law in that ancient seat of learning.

The career of this illustrious man has been dwelt upon in all the public journals: and, in anticipation of a full Memoir of his life, I cannot better sum up those salient features of his character, which won for him so high a place in the regard and estimation of his countrymen, than by quoting the following paragraph from the 'Times' of the 25th of last October, which concludes a very striking and animated sketch of his life:—

"We have spoken of Lord Derby chiefly as a statesman. But, after all, it is the man—ever brilliant and impulsive—that has most won the admiration of his countrymen. He was a splendid specimen of an Englishman, and whether he was engaged in furious debate with demagogues, or in lowly conversation on religion with little children, or in parley with jockeys, while training 'Toxophilite,' or rendering *Homer* into English verse, or in stately Latin discourses as the Chancellor of his University, or in joyous talk in a drawing-room among ladies whom he delighted to chaff, or in caring for the needs of Lancashire operatives, there was a force and a fire about him that acted like a spell. Of all his public acts none did him more honour and none made a deeper impression on the minds of his countrymen than that to which we have just alluded—his conduct on the occasion of the cotton famine in Lancashire. No man in the kingdom sympathised more truly than he with the distress of the poor Lancashire spinners, and, perhaps, no man did so much as he for their relief. It was not simply that he gave them a princely

donation; he worked hard for them in the committee which was established in their aid; he was, indeed, the life and soul of the committee, and for months at that bitter time he went about doing good by precept and example, so that myriads in Lancashire now bless his name. He will long live in memory as one of the most remarkable, and indeed irresistible, men of our time—a man privately beloved and publicly admired, who showed extraordinary cleverness in many ways, and was the greatest orator of his day."

The Marquis of WESTMINSTER, K.G.—This good, accomplished and benevolent nobleman joined the Society in 1844, under one of my former presidencies. Educated at Westminster School, and afterwards at the University of Oxford, he entered the House of Commons as Lord Belgrave, and sat as member for Chester for twelve or thirteen years.

In 1845 he succeeded to the princely estates and titles of his father, the first Marquis of Westminster, and during his subsequent life he made good use of his vast wealth by giving largely and munificently to public hospitals and charities, besides laying out vast sums in the erection of churches.

Those who knew Lord Westminster well, could not but be struck with the simplicity and ingenuousness of his character, and his constant desire to do all justice to those with whom he was in any way connected. He was, besides, a liberal patron of the Fine Arts; whilst, like a true English nobleman, he supported the breed of our race-horses, which, by his predecessor, had been so much improved.

RALPH WILLIAM GREY.—By the decease of this most amiable and accomplished man, I have lost one of my most esteemed friends. Serving many years as a Member of Parliament, and having been successively secretary of Lord Palmerston and of Earl Russell, his conduct was ever such as to gain for him the esteem and, I may also say, the love of all who had any communication with him. He was for some time a member of our Council, and always took a warm interest in all our proceedings. At the time of his decease, on the 1st October last, he occupied the post of Commissioner of H.M. Board of Customs.

JOHN HOGG.—This gentleman, who died on the 16th September last, was a zealous antiquary and historical geographer, who served on our Council in former years, and was, in the years 1849 and 1850, one of the Secretaries of this Society. His published memoirs in those departments of our science which he cultivated, were very numerous; among them I may notice 'Gebel Hauran, its adjacent

Districts and the Eastern Desert of Syria, with Remarks on their Geography and Geology,' published in 1860; 'On some old Maps of Africa, in which the Central Equatorial Lakes are laid down nearly in their true positions' (1864); 'The Geography and Geology of the Peninsula of Mount Sinai and the adjacent Countries' (1850); and 'Remarks on Mount Serbal' (1849). Mr. Hogg was a Fellow of the Royal and Linnæan Societies.

Dr. PETER MARK ROGET, F.R.S.—This venerable philosopher, who died on the 13th September last, in the 91st year of his age, had long occupied a distinguished place among the men of science of our country, and was one of my oldest scientific friends.

His chief contributions to science were physiological, and were communicated in a series of memoirs to the Royal Society, of which body he was the Secretary during many years, in association with numerous Presidents, from Sir Humphry Davy downwards. Courteous and affable in manners, he was an excellent man of business, and on more than one occasion presided over the Physiologists at the meetings of the British Association for the Advancement of Science. His reputation, indeed, stood so high, that when the Earl of Bridgwater bequeathed 10,000*l.*, to be given to those authors who should best demonstrate the glory of God in the works of creation, Dr. Roget was selected by the President of the Royal Society to write that 'Bridgwater Treatise on Animal and Vegetable Physiology' which was so well received by the public.

The last work of Dr. Roget's with which I am acquainted—the completion, indeed, of his laborious studies on this subject during fifty years—was entitled a 'Thesaurus of English Words and Phrases,' and in it we trace the same fulness, perspicuity, and closeness of research which are apparent in all his productions.

ARTHUR KETT BARCLAY.—This benevolent gentleman, who, since the decease of his excellent father, so long M.P. for Southwark, has been at the head of the great Southwark Brewery, was from his youth an ardent pursuer of various branches of Natural Science.

He cultivated for many years the science of Astronomy with success, and established a very effective observatory at his country seat of Bury Hill, near Dorking.

By his death I have lost a friend of forty-three years' standing, and who through life was respected and beloved by the large circle of those who had the privilege to know him.

SAMUEL S. HILL.—This gentleman, who died in his 72nd year,

spent the earlier period of his life in Prince Edward's Island, where his father possessed a large tract of land. After a tour through the United States and the Canadas, he published a thoughtful and useful book, entitled 'The Emigrant's Introduction.' He subsequently commenced a series of travels through the Old World, and his journeys through Greece, Syria, and Egypt having been published, his travels through Russia and Siberia, ending with a voyage round the world, justly attracted very considerable notice.

Though unacquainted with Mr. Hill myself, I learn from those who knew him well that his manners were gentle and winning; whilst his writings convey to the reader an impression of the perfect truthfulness and the guileless simplicity of his character.

Mr. CORNELIUS GRINNELL.—Cornelius Grinnell first came to this country in the year 1856, and whilst he was received with the cordiality which was due to the son of the eminent New York merchant who contributed in so princely a manner to the American expeditions in search of Sir John Franklin, his own kindness of manner and generous disposition rendered him a general favourite with all who came in contact with him.

Besides the aid and assistance rendered by Mr. Henry Grinnell in the search for our missing countrymen, we are indebted to him, in a great measure, for the equipment of those expeditions under Kane, and Hayes, and Hall which have added so much to our geographical knowledge of the Arctic seas; but, in addition to these services in the aid of science, there breathes throughout his correspondence a constant desire to promote goodwill between the two countries. Thus in March, 1855, he writes:—

"I have a letter from Sir F. Beaufort, in which he, in the most honourable manner, states that the Americans have the right to the name Grinnell Land: not that I care an iota about it myself, but this little circumstance has more weight than one would suppose; the result will be to create in the minds of many a kindly feeling towards your country."

Again, in 1855, on the departure of Hartstene's expedition to relieve Dr. Kane:—

"I believe there has been nothing left undone, on the part of the British officers, to give every possible information that could be of service. If nothing else resulted from it, it will create a good feeling between the two countries."

And in 1856, on the restoration of the *Resolute*:—

"You are, no doubt, aware that a resolution has passed both

Houses of Congress, without a dissentient voice, to restore to your Government the barque *Resolute*. I think your Government will receive her in the same kind spirit that she is tendered in, and that the act itself will have the effect to increase the friendship of the two countries."

Cornelius Grinnell was present when her Majesty the Queen received the *Resolute* from the American officers.

These short extracts will, I feel sure, induce the Fellows of the Royal Geographical Society to join with me in sympathy with the father on the loss of a son who, during his residence among us, so ably personated the feelings of his parent towards this country. We have the melancholy consolation that his untimely end was occasioned in the act of doing a kindness to a friend.

Colonel George Gawler, K.H.—This meritorious public servant, who died on the 7th May, 1869, was very favourably known to geographers by the lively interest he took in promoting researches in South Australia, from Adelaide, during the period he acted as Governor of that colony. On his return to this country he took a deep interest in our proceedings, and during the last twelve years was a frequent attendant at our evening meetings and a very instructive speaker whenever Australian discovery was the topic. He always produced the impression that he was a sincere and truthful observer, and several of his observations respecting the probable condition of the interior of Australia have been proved to be correct by recent discoveries. Colonel Gawler was born in 1796 and served during the eventful years from 1811 to 1814 in the Peninsular war, where he led one party at the storming of Badajoz.

Mr. James Macqueen.—As I was closing these obituary notices, I received the news of the death of that distinguished veteran geographer, my old and respected friend, Mr. James Macqueen, who died on the 14th inst., at the very advanced age of ninety-two. He was born in the year 1778, at Crawfurd, in Lanarkshire, and used to relate that his attention was first drawn to African geography, in the study of which he was chiefly occupied during his maturer years, by the perusal of 'Mungo Park's Travels.' During the time he was resident in Grenada, in the West Indies, as manager of a sugar-plantation, whilst reading the exciting narrative aloud to a friend one night, he noticed that a negro boy in the room stood listening very attentively, especially to those passages in which the Joliba was mentioned. The boy

being afterwards asked why he showed such interest, said that he knew all about the Joliba, and that he was a Mandingo, born in the country of the Upper Niger. The information obtained through this intelligent boy was afterwards of great use to Mr. Macqueen, when he was engaged in bringing together all that was known about the geography of the Niger, a subject on which he became a leading authority. He was the first, I believe, who demonstrated, before the discovery was actually made, that the Niger emptied itself into the Bight of Benin. Subsequently he published, through Mr. Arrowsmith, the first map, approaching to correctness, of the interior of Africa. He was a trenchant and vigorous writer, and a keen critic; but his literary productions were chiefly confined to articles in newspapers and periodicals. Some of his geographical memoirs were read before our own Society, and published in the 'Journal.' He was known also as a political and historical writer, and was, in the early part of the present century, the proprietor and editor of the 'Glasgow Herald.' As a man of action, he distinguished himself in the projection and organization of two of the most useful and prosperous chartered companies, the "Colonial Bank" and the "Royal Mail Steam-Packet Company." In making the preliminary arrangements for the latter, he visited the various countries embraced in the intended operations, and, on his retirement, received the most flattering testimonials from the Company. His memory and interest in geography and public questions were preserved, in scarcely diminished freshness, almost to the hour of his death, and his last moments were passed in great peacefulness. In him the Society has lost one of its most attached members.

The other Fellows who have departed this life, but who have not taken an active part in geographical inquiries, are Colonel W. Anderson, C.B.; Mr. F. D. P. Astley; Mr. Hugh G. C. Beavan; Captain A. Blakeley; Captain Harby Barber; Mr. H. Blanshard; General Sir Wm. M. G. Colebrooke, K.H., C.B.; Mr. Alfred Davis; Major J. W. Espinasse; Mr. A. Findlay (one of the few remaining members of the Society who joined in the year of its foundation, 1830); Mr. G. F. Harris, M.A.; Mr. John M. Hockly; Mr. R. Jardine; Mr. Wm. John Law; Mr. D. Meinertzhagen; Dr. Charles James Meller; General Alex. F. Mackintosh, K.H.; Mr. G. T. Miller; Dr. David Maclonghlin; the Bishop of Manchester (Rev. Dr. Lee); Mr. Frederick North, M.P.; Mr. C. O'Callaghan; Mr. Samuel Perkes; Mr. Thomas Rawlings; Mr. Arthur Roberts;

Captain Wm. Strutt; Lord Sudeley; Mr. Theodosius Uzielli; Captain G. Whitby; and Mr. Champion Wetton.

Lastly, I am proud to record that our Society was honoured by the Fellowship of the late Mr. George Peabody, the good and meritorious philanthropist of the United States, to whom our country is so deeply indebted.

Admiralty Surveys.*

The hydrographical surveys under the Admiralty have made their usual satisfactory progress during the past year, and, in connexion with them, the exploration of the deep sea, which was commenced in H.M.S. *Lightning*, in the summer of 1868, has been most successfully followed up in the *Porcupine* during 1869. This vessel, ordinarily employed under Staff-Commander E. K. Calver in the survey of the coasts of the United Kingdom, was placed by the Admiralty at the disposal of the Council of the Royal Society for this special and most interesting research, and being fully equipped, and supplied with the necessary instruments and scientific apparatus, she left Woolwich on the 17th of May, and continued to explore the deep-sea bed, from the northern part of the Bay of Biscay, round the west coasts of Ireland and Scotland to the Faroe Isles, until the end of September. During this period important discoveries were made in various branches of physical science, sounding and dredging operations were successfully carried out to the extraordinary depth of 2345 fathoms, or nearly three miles, and very valuable observations on deep-sea temperatures made. The expedition was divided into three separate cruises, and the scientific operations were presided over, respectively, by Dr. Carpenter, Professor Wyville Thomson, and Mr. Gwynn Jeffreys. An account of the results will be found in the 'Proceedings of the Royal Society,' as well as in a lecture delivered at the Royal Institution by Dr. Carpenter, and printed in its 'Proceedings.'

Home Coasts.—In consequence of the many calls for re-surveys of certain portions of the coasts of the United Kingdom, owing to considerable changes which are taking place, especially on the western shores of England between Anglesea and the Solway Firth; a second vessel, the *Lightning*, has been equipped to meet these demands, and will immediately commence her operations under Staff-Com-

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* Furnished by Capt. G. H. Richards, R.N., Hydrographer.

mander John Richards, late in charge of the Channel Island Survey, which, as was anticipated in our last report, has now been completed. During the last summer the offshore soundings from these islands were obtained and carried as far west as the longitude of 3° 20′; a series of tidal observations were also made throughout the whole extent of the group, and diagrams placed on the chart, by which the precise direction and strength of the stream can be seen at a glance for each hour,—a matter of considerable importance in a region so exceptionally dangerous to strangers.

The charts of the whole group are now published in a complete state, on a scale of 4 inches to the mile, with suitable sailing directions.

Portsmouth.—Staff-Commander Hall, with a steam launch and small party, has been occupied in making a large-scale survey of the whole of the harbour,—a work much required. Accurate tidal observations have been made, and levellings carried through to Langston Harbour, in order to ascertain the probable effect of the tidal scour on Portsmouth Harbour and its bar, when the gun-boat channel connecting the two shall have been completed and opened.

A re-survey of Portsmouth Bar will next be made, with the view of ascertaining whether any change has taken place in the depth of water since it was last deepened by dredging.

Mediterranean.—Captain Nares and the officers of the *Newport* have completed the survey of the coast of Tunis and its off-lying banks, from Cape Carthage, to Tabarca Island, about a hundred miles to the westward, up to which point the south coast of the Mediterranean had been surveyed by the French. The *Newport* has also surveyed the island of Pantellaria in the Malta Channel, and re-surveyed the port of Alexandria; she passed several times through the Suez Canal, at its opening, and subsequently with the Hydrographer of the Admiralty and Director of Engineering works, who were sent to report on that great work, when soundings and sections were taken throughout the length of the canal, and a survey made of Port Said and its approach.

Strait of Magellan.—Since the last report, the *Nassau*, Captain Mayne, C.B., has returned from this survey. The result of her last season's work has been the examination of 255 miles of the channels leading from the straits into the Gulf of Penas, and the survey of twenty anchorages or havens, most of which were previously little known; ships of any size may now pass from the Atlantic to the Pacific by this route in safety, with no lack of convenient stopping-

places, and the Hydrographic Department will shortly be in a position to issue an entirely new series of charts, from Cape Virgin in the Atlantic to the Gulf of Pénas in the Pacific, on scales which will render the navigation easy and free from risk.

On the return voyage, the *Nassau* was employed in searching for some of the numerous doubtful dangers which still disfigure our charts of the Atlantic, and whose origin in many cases it is difficult, if not impossible, to trace.

North China and Japan.—The *Sylvia*, employed on these coasts, has been mainly employed in surveying the intricate portions of the great Inland Sea of Japan, through which so great a trade now passes, including many mail and passenger vessels, as well as the ships of war of all countries.

A portion of the western shore of the Gulf of Yeddo has also been surveyed.

In connexion with this survey a considerable portion of the Upper Yang-tsze River has been explored and mapped by Lieutenant Dawson, and Mr. Palmer of the *Sylvia*.

The highest point on this river previously explored was the southern entrance of the Tung-Ting Lake, about 120 miles above the city of Hankow, and upwards of 700 miles from the sea. The labours of these officers have now provided us with maps, which have been published by the Admiralty as far as the city of Kwei-chow, which is nearly 1000 miles from the sea, and where navigation, except for the smallest class of Native boats, may be said to cease.

During last year Commander Brooker, who had ably conducted this Survey up to that time, was compelled to resign from ill health and return to England, and Navigating-Lieutenant Maxwell remained in charge. The *Sylvia* has since been re-commissioned in China for a further term of service, and Commander H. C. St. John has been appointed to conduct the Survey.

China Sea.—Staff-Commander Reed and the officers of the *Rifleman* have during the past year made an excellent survey of Balabac Strait, leading between Borneo and the Island of Palawan, from the China into the Mindoro or Sulu Sea. During this survey upwards of 2000 square miles of soundings have been obtained, in the examination of the numerous reefs and dangers which lie in and above the approach to this strait.

The *Rifleman* having been found defective was disposed of in China, and the surveying officers returned to England at the close

of last year. H.M.S. *Nassau*, under Commander Chimmo, is about to leave England in further prosecution of this survey, and its extension into the Sulu Sea and eastern passages, of which almost nothing is known, except that at present it is a most dangerous though necessary highway for sailing-ships.

Newfoundland.—Staff-Commander Kerr, with one assistant, has, in a hired vessel, during the past year completed 300 miles of the eastern shores of this Colony, in that dangerous locality north and west of Togo Island.

During the early part of the season, while the ice was closely packed on the shore north of Cape Freels, the party were employed in surveying portions of Bona Vista Bay, until driven out of it by the pack, which ultimately drove into the bay on the 12th of June, and filled its arms up with ice 10 feet thick.

During the laying of the French Atlantic Cable, the surveyors were enabled to render valuable assistance to the *Great Eastern* and her fleet, among the banks in the vicinity of St. Pierre, and in laying the shore end of the cable from that island.

West Indies.—Staff-Commander Parsons with two assistants, in a small hired sailing-vessel, has made a complete survey of the Island of Barbadoes, including a plan of Carlisle Bay, the principal anchorage, on a scale of 20 inches to the mile.

The Survey has been lately removed to the Colony of British Guayana, which, combining as it does an extensive coast-line with outlying shallow banks and the mouths of important rivers, is a work of considerable magnitude and difficulty to be undertaken with such narrow means.

British Columbia. The surveyors in this colony, under Staff-Commander Pender, have been usefully employed in examining the exposed western shores of the offlying islands northward of Vancouver Island, and in sounding the outer and rocky entrance to Queen Charlotte Sound.

One hundred and twenty miles of coast, from Cape Calvert to the south-east point of Banks, Island have been surveyed, with the various passages leading to the main inner channel. It is considered that by the close of the present year sufficient will be done to meet all the requirements of navigation and commerce for a very long period, and it is intended that the Survey shall be withdrawn.

Cape of Good Hope.—The survey of the west coast of this colony has progressed very favourably during the past year, under Navigating-Lieutenant Archdeacon: the shore from Table Bay

northerly to Lambert Cove, a distance of 130 miles, has been minutely examined, and a thorough survey made of Saldanha Bay,—a want that has been long felt.

The numerous outlying dangers, which extend in some instances for several miles from the coast between Saldanha and St. Helena bays, the exact positions of which have been very doubtful, have been a source of anxiety at all times to seamen approaching Saldanha, which will now be set at rest by the publication of a correct chart. A re-survey has also been made of False Bay, resulting in the discovery of some hitherto unknown dangers,—a circumstance of considerable importance in this much frequented locality.

The surveying party are now working northward towards the Orange River, and have suffered much inconvenience from the scarcity and brackishness of the water, and the almost entire absence of inhabitants in the vicinity of the coast, where the country is little better than a desert.

South Australia.—The surveying party in this colony have been employed in the examination of Nepean Bay and the Southern Coast of Kangaroo Island, also in completing the survey of Backstairs Passage, between that island and Cape Jervis.

It is with much regret that we have to record the deaths of Captain John Hutchison, lately in command of the Survey, and of Lieutenant Guy, his assistant, which occurred in July last, almost suddenly, and within five days of each other, from illness brought on through exposure in the execution of their duties. In the untimely deaths of these officers the Naval service has lost two able and zealous public servants.

The Survey is now being carried on by Navigating-Lieutenant Howard.

Victoria.—During the past season the survey of the Colony of Victoria has been carried on principally in an easterly direction from Port Phillip, and the coast is now completed from a few miles west of Cape Otway to Port Albert, a town about 30 miles north-east of Wilson's Promontory. A survey has also been made of Portland Bay, westward of Cape Otway.

The *Pharos*, Colonial government steamer, in which the survey is being carried on, has been employed also in assisting the laying of the Submarine Cable between Victoria and the north coast of Tasmania.

New South Wales.—The Coast Survey of New South Wales is now

complete. The work of last year has been entirely confined to deep-sea sounding, the limit of the hundred-fathom line having been determined from off Point Danger, the northern boundary of the colony, to Cape Howe, its southern extreme, a distance of 600 miles; thus enabling the navigator, by the use of the lead, to determine his position with accuracy,—an advantage not to be over-estimated on approaching a coast where easterly gales and thick weather are by no means infrequent. Although the surveying party have been withdrawn from the coasts of New South Wales, Navigating-Lieutenant Gowland, lately in charge of it, has been kept, at the request of the Government, to examine and survey the rivers and inner waters of the colony, the expense of which they have determined to defray from colonial resources.

Queensland.—The survey of the Coast of Queensland, under Navigating-Lieutenant Bedwell, has progressed very favourably during the past year. The outer coast of Great Sandy Island from Indian Head, northward round the dangerous Breaksea Spit, and the western shore of Hervey Bay, amounting in all to 100 miles of coast-line, have been closely examined, and thickly and carefully sounded; and perhaps on no part of the Australian continent has a survey been so much needed or been more skilfully executed. The work is carried on by two officers in a small colonial sailing-vessel.

West Coast of Africa.—The very imperfect and fragmentary surveys which existed of the entrances of some of the rivers on this coast, frequented by ships employed in the oil-trade, had become so detrimental to the interests of commerce, that last year the Admiralty attached a surveying officer to the senior officer's ship on that station, in order that he might take advantage of any opportunities which might offer, during the visits of our cruisers, to rectify the erroneous charts; and Navigating-Lieutenant Langdon, who was selected for this duty, has already performed very good service in the examination of the mouths of the Binon and Brass rivers, the Bonny, New and Old Calabar, and the Cameroon rivers, the corrected surveys of which will shortly be published.

Mr. Langdon is at present engaged in correcting the survey of the Sherbro River.

Summary.—During the preceding year seventy-one new charts have been engraved and published, and upwards of 1200 original plates have been added to or corrected, while 139,000 charts have been printed for the use of the Navy and the public. Sailing Direc-

tions have been published for the West Coast of England and for the Channel Islands, as well as various hydrographical notices, and the usual annual works, such as Tide Tables, &c. Light Lists have been issued.

In concluding the present notice, it will not be considered out of place to record that two names well known to the nautical world in connexion with hydrographical labours have lately disappeared from the rolls of the Hydrographical Department, in the retirement of Commanders Edward Dunsterville and John Burdwood; the name of the former associated for nearly thirty years with all matters relating to charts, and the latter for a scarcely less lengthened period with the annual tide-tables and other useful compilations.

It is due to these old and valued public servants to record, and it is believed it may be done with strict truth, that in the management of their respective important departments there has never been a default throughout their lengthened term of office, and to replace them will not be an easy task.

NEW PUBLICATIONS.—*Journal of the Society*, Vol. 39.—In noticing some of the chief Geographical works published during the year, I may justly commence with the volume of our own 'Journal,' which contains the more important Memoirs presented to the Society, and is properly classed among the chief contributions to the Geographical literature of each year. The number of papers published in the volume is seventeen, of which twelve are accompanied by maps. Among those to which attention may more particularly be called are the following:—'Notes on Manchuria,' by the Rev. Alexander Williamson, illustrated by a map, in which routes are inserted from a sketch furnished by the author, who travelled from the Gulf of Liau-tung to Sansing, the most northerly city in this direction of the Chinese empire; 'From Metemma to Damot,' in Western Abyssinia,' by Dr. H. Blanc, in which is conveyed much new information regarding this region, and especially the configuration of Lake Dembea, as depicted on the accompanying map; 'Journey in the Caucasus, and Ascent of Kasbek and Elbruz,' by Mr. Douglas W. Freshfield; 'On the Basin of the Colorado and Great Basin of North America,' by Dr. W. A. Bell; 'Account of the Swedish North Polar Expedition of 1868,' by Professor A. E. Nordenskiöld and Captain Fr. von Otter, accompanied by a map, in which the bays of the northern part of the islands are laid down according to tracings supplied by the authors; 'Report of the Trans-

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Himalayan Explorations during 1867,' by Captain T. G. Montgomerie, containing the visit of the Pundits to the gold-mines of Western Tibet; 'Narrative of a Journey through the Afar Country,' by M. Werner Munzinger, the zealous and able agent of this country, previous to and during the Abyssinian war; a most valuable contribution to the geography and ethnology of a part of Eastern Africa of which scarcely anything was previously known, the accompanying map being drawn from the author's own sketch; 'Journey of Exploration to the Mouth of the Limpopo,' by St. Vincent Erskine; and lastly, 'Notes on the Map of the Peninsula of Sinai,' by the Rev. F. W. Holland.

Petermann's 'Geographische Mittheilungen.'—The principal Geographical publication of the continent of Europe, as I have had occasion in previous years to remark, is the 'Geographische Mittheilungen,' edited by our Medallist and Honorary Corresponding Member, Dr. Petermann, and published by Justus Perthes, of Gotha. The large number of maps, so attractive for their fulness of detail and the amount of new information they impart, is a well-known feature of this important and truly scientific serial. During the past year I remark, in the first place, highly-finished maps of the English surveys made in Abyssinia during the war, with corresponding text, in which the march of our army, and the new information gleaned concerning Abyssinian geography, are given in a clear and attractive manner. In the fifth part for 1869 there is also an account of the most recent scientific expeditions of the Russians in Central Asia, and a map of the Thian-Shan system between Issyk-Kul and Kashgar, both of which ought to be consulted by those interested in the geography of Turkistan. A sketch-map of the great French Expedition from Cambodia to the Yang-tsze-Kiang is also given in the same part, in anticipation of the French official map not yet published. Other Memoirs of value are the following:—'Scientific Results of the first German Arctic Expedition,' by W. V. Freeden (Part VI.); 'Eduard Mohr's Astronomical and Geognostic Expedition in South Africa' (Parts VII. and VIII.); 'Latest Travels and Explorations in China: Baron von Richthofen's Geological Investigations since September, 1868' (Part IX.); 'The Telegraph Expedition on the Yukon in Alaska,' with map (Part X.); 'New Guinea: a German Appeal from the Antipodes,' with map of New Guinea (Part XI.), a communication worthy of attention by those who take an interest in our settlements in tropical Australia, and in the prospect of a German colonization of New Guinea and

the neighbouring islands; Mauch's 'Travels in the Interior of South Africa,' with map; 'Sketch of the Physical Geography of the Sutlej Valley,' by Dr. F. Stoliczka (Part I., 1870), and others, which the limited time at my disposal precludes me from enumerating.

Keith Johnston's last Works.—What Petermann is to the Continent of Europe, our associate Keith Johnston is to the British Isles and the Colonies. His last works, to which I have alluded in a former Address, demonstrate the results of pertinacious and exhaustive labours, which bring out in salient relief, in clear tables and beautiful maps, all the latest geographical acquisitions.

I shall allude elsewhere to the treatise of his son on the discoveries of Livingstone, and I hope that at our next Anniversary Meeting the father of this family of geographers, of whom Scotland is so proud, will be placed on the same footing as Arrowsmith of England and Petermann of Germany, by being assigned one of our Royal Geogragraphical Medals.

Kohl's 'History of the Discovery of Maine.'—I must not here omit to notice a work of great value, on the history of geographical discovery, which has been issued during the past year under the auspices of the Maine Historical Society. Under the general designation of a 'History of the Discovery of Maine,' this elaborate work is, in truth, a history of the discovery of the East Coast of North America, from the time of the Northmen in 990, to the Charter of Gilbert in 1578. Its author is Mr. J. G. Kohl, of Bremen, whose name is already well known to us by his numerous books of travels, works, not antiquarian only, but based upon his personal observations in America and most of the principal countries of Europe.

In this new volume Mr. Kohl has given, in a compact and lucid manner, the results of a most laborious investigation of the scattered and often obscure documents which survive from the early times of which he treats. The work is illustrated by extracts from no less than three-and-twenty maps, the latest of which is Mercator's of 1569. It may well be imagined that when a volume, embodying such documents as these, has the abstruse subjects of which it treats dealt with by a man of extensive reading, untiring industry, and remarkable critical sagacity, such as Dr. Kohl, I am drawing your attention to a work of no ordinary importance. It is, in truth, a handbook to the history of Western discovery; and it is much to be regretted that its circulation should be limited to the members of a private Society in America. I may observe that it was at the suggestion of one of our Secretaries, that Mr. Kohl

was invited to undertake this responsible and laborious task, and Mr. Major is justly proud of so successful and honourable a result.

Marcoy's 'Voyage à travers l'Amérique du Sud.'—Although not coming within the definition of scientific geography, illustrated books of travel are deserving of some notice in a summary like the present, as tending greatly to diffuse a knowledge of distant regions and a taste for geography among the great body of the public. In our early days the copiously illustrated quarto books of voyages, which were then the usual form of publication, were the delight of young readers imbued with the spirit of adventure; but the production of this class of works seems of late years to have been abandoned by our English publishers. In France such books continue to appear, and with a profusion of beautiful engravings and a luxury of type and paper which excite our astonishment, more particularly as they appear intended for, and succeed in obtaining, a wide circulation. One of these works, published by Messrs. Hachette & Cie, is the 'Voyage à travers l'Amérique du Sud,' by M. Paul Marcoy. It contains a narrative of travel and adventure across the continent of South America at its broadest part, commencing with Islay on the Pacific Coast, and passing by Arequipa and Cuzco to the head-waters of the Ucayali, and so on to the River Amazons, and down that great stream to the Atlantic. The illustrations, apparently from drawings by the traveller, are to the number of many hundreds, most beautifully engraved and printed, and the landscape views more particularly convey a vivid idea of the wonderful and varied scenery through which the author passed. A work of this nature, in two large quarto volumes, and evidently intended for popular reading, could scarcely be undertaken by an English publisher, although one would think that such books, as conveying much knowledge of distant regions, by the pictorial illustrations alone, would be well received by the British public. Another work of the same class, and by the same publishers, the 'Japon illustré,' by M. Humbert, has already attracted some attention in England, and deservedly so. The author was the Swiss Minister in Japan, who made good use of his exceptional opportunities in studying the singular country and people amongst whom he lived. Most of the engravings, which thickly stud the two handsome volumes, appear to have been copied from photographs, and are most satisfactory for their evident fidelity. The text, too, forms pleasant and instructive reading, and stamps M. Humbert as a thoughtful observer and pleasing writer.

Millingen's 'Wild Life among the Koords.'—An interesting volume, with this title, has recently appeared from the pen of Major F. Millingen, whose earlier work on Turkey was noticed in one of my former Addresses. Together with some curious and entertaining descriptions of wild life in the remoter districts of Koordistan and Armenia, this work gives us geographical notices of many little-known parts of this region; such as the valley of the Ennis and its junction with the Upper Euphrates, Lake Nazik; the navigation, harbours, &c., of Lake Van; Lake Ertjek, with its poisonous waters; and the tract of territory lying being Lake Van and the Persian frontiers, forming the watershed between the Caspian and the Persian Gulf. A map accompanies the work, in which these various new features are delineated from information furnished by the author.

Italian Geographical Society.—Our distinguished Foreign Associate, the Commander Cristoforo Negri, who worthily presides over the geographers of Italy, has, in his recent instructive Address, dilated with much eloquence on the progress of geography, and on the recent discoveries in many of those distant regions in which we take the deepest interest. Following our example, he laments in his obituary list the death of Count Lavradio, so long the Portuguese Minister at our Court. Although this highly-cultivated and much-respected man was not in our Society, he belonged to the affiliated body, the Hakluyt Society, and took a warm interest in eliciting every portion of knowledge relating to the earliest discoveries of the Portuguese in Africa and the Indies. Our Secretary, Mr. Major, in his memorable work, the 'Life of Prince Henry of Portugal,' of which I spoke to you in a former Address, has, indeed, done full justice to Count Lavradio, and I now add my tribute to the memory of this learned man.

The geographical knowledge of Count Lavradio was so extensive, his heart so thoroughly devoted to the advancement of the cause, and he was so justly proud of being the descendant of Francisco d'Almeida, the first Viceroy of India, that he well deserves due praise from the hands of a Geographical President. The maps which, by his exertions, were extricated from the archives in Portugal, threw great light on mediæval geography; and among them are those maps of Africa which were constructed at the period when the Pope allotted so very large a part of that vast country to his faithful Portuguese.

Signor Negri's comments on the recent discoveries in Africa are very attractive, and I rejoice in knowing that the Italian Society has now reached the large total of upwards of 1000 members.

The Canal of Suez.—As the opening out a navigable communication between the Mediterranean and the Red Sea is unquestionably the greatest work of our age, let us offer our warmest congratulations to M. de Lesseps for having conceived and completed a project which was at first thought impossible by many; but in which—much to their honour—his countrymen, the French, have throughout been his vigorous supporters. Still, without the hearty concurrence of the Khedive of Egypt and his munificent aid, this very difficult operation could never have been realised. This water-communication, or Bosphorus, which has insulated Africa, has been well styled by Cristoforo Negri, the President of the Italian Geographical Society, the "Straits of Lesseps," just as the Straits of Cook, Magellan, and Behring bear the name of those who first navigated in those waters.

For the honour of our Society, it is right to record that the ruler of Egypt specially invited your President to attend the great ceremony of the opening of the Canal, and nothing more mortified me than being obliged, from the state of my health at that time, to decline the proposed distinction. Anxious, however, that our body should be well represented, I induced my friend, Lord Houghton, one of the Trustees and a permanent member of our Council, to represent the Society on this memorable occasion, and the manner in which his Lordship has executed this duty met with our entire approval.

The elaborate Report on the Canal, by Captain Richards, the hydrographer, and Colonel Clarke, R.E., recently published by the Admiralty, will be reprinted in the third number of our 'Proceedings.'*

Central Asia.—In this year, as in the last, the chief advances in geographical knowledge have been made in Central Asia, and especially in those parts of the great mountain back-bone of the Old World which lie to the north-west of our Indian empire, and

* In reference to this subject, I may state that our Associate, Captain H. Spratt, so distinguished by his former communications on this branch of Mediterranean hydrography, which I have noticed in former Addresses, informs me that he adheres to his views respecting the inevitable direction of the silt as carried eastward from the mouth of the Nile by the steady marine currents, and hence he believes in the eventual silting up of Port Said.

in the vast territory so recently opened up to us, which is now designated as "Eastern Turkistan," in contradistinction to Western, or what really is at present "Russian Turkistan." When I addressed you at the last anniversary, I could only speak of Mr. Shaw as having successfully penetrated by Yarkand to Kashgar with his cargo of tea from Kangra, and of his having been well received by the great chief Yakoob Kushbegi, who has since been recognised under the much grander title of Ataligh Ghazi, or "Leader of the Faithful." A residence of several months in Eastern Turkistan enabled Mr. Shaw to establish friendly relations with that powerful ruler, who, as we now know, has sent a special Envoy into British India with a letter for the Queen, and another for the Viceroy of India. The latter, in a letter to myself, has expressed his gratification at the prospect of establishing friendly intercourse with this new nation, as leading to an interchange of the products of Eastern Turkistan with those of the British empire.

So long as China held that fine region in thraldom, which was the case during a whole century, down to 1864, the native Mussulman population were never more than partially subjugated; so that, as soon as a brave and sagacious leader appeared in the person of Yakoob Kushbegi, the Chinese yoke was easily thrown off, and a country, which previously was a continual hotbed of insurrection, and subject to every sort of anarchy, has now, we learn, become a well-regulated and orderly state, under the stern, yet just, rule of this one leader.

There is something quite refreshing and encouraging in the fact that the Envoy of this great ruler will, in his progress to Calcutta, have witnessed a great Durbar of Indian Princes assembled under the presidency of our Queen's son, the Duke of Edinburgh, and that, after having seen some portions of our army and of our marine, of the latter of which the '*Galatea*' frigate will be a favourable specimen, he will return to his native Turkistan, impressed with a deep sense of the value of an intimate alliance with an adjacent empire possessing such colossal resources.

The accidental meeting, at Shadula on the Himalayan frontier of Eastern Turkistan, of Mr. Hayward, the Envoy from our Society, and Mr. Shaw, which at first sight was naturally viewed with suspicion by the Yarkandi people, has in the end proved very advantageous to us as leading to a great addition to our knowledge. For as soon as the Ataligh Ghazi had satisfied himself that our countrymen were respectively engaged in very different occupa-

tions—the one seeking to open out a trading intercourse, the other endeavouring to delineate the features of a region quite unknown to Europeans—he acted with great kindness, and has since shown his good feeling by the transmission, already alluded to, of a special Envoy to the Governor-General of India.

As Mr. Shaw is now among us, and has already communicated, at an evening meeting, an animated sketch of his travels, we may feel assured that the work he is preparing on the subject of his journey will attract, in the most lively manner, the British public.

The mission which the Council confided to Mr. Hayward has been already attended with highly important results. For although we know not as yet whether he has succeeded in entering the great lofty plateau of Pamir, which was the main object of his travels, for it is possible he may have been by native tumults deflected from that purpose, or by the impracticability of traversing the mountainous tracks east of Gilgit, which lie to the west of the territories of Cashmere and the British outposts, yet he has already well employed his time in taking a route which led him to Yarkand, and in course of which he fell in with Mr. Shaw. Whilst waiting in a state of surveillance at Shadula on the frontier, he contrived to escape the vigilance of his guards, and crossed the mountain ranges near the sources of the Yarkand River to survey the country. It was during this rapid excursion that he was enabled to make very great additions to our geographical knowledge. He demonstrated, for the first time, the true course of the Yarkand River, as well as that of the Karakash, ascended to the sources of the former, on the northern slopes of the Karakorum, and obtained information of a better pass, the Yangi, over the Kuen Lun, than the one at present used by traders. He was, moreover, enabled to sketch the outlines of this remarkable mountain-region, with its glaciers and fertile valleys, and also to lay down, for the first time, a number of positions of latitude, longitude, and altitudes, which were hitherto entirely undetermined.

We cannot too much admire the zeal, talent, and singular courage displayed by Mr. Hayward in carrying out these researches, in a country in which, had the inhabitants discovered the only small scientific instrument he possessed, they might at once have killed him.

Nothing daunted by his first failure to penetrate to the Pamir Steppe, he is now endeavouring, since his return from the Yarkand and Kashgar journey, to traverse the country occupied by those

warring and savage tribes who hold the passes which lie to the south of that great plateau. If he should succeed in this traverse, he apprehends that he will have comparatively little difficulty in exploring the Pamir Land, its nomad Kirghis inhabitants not being savage or warlike. In case, however, that he should find it impossible to run the gauntlet once more by repassing the hostile tribes lying between Pamir Land and British India, he expresses a hope that we should endeavour to obtain the sanction of the Russian Government, that in that case he might be permitted to return to England by passing through Russian or Western Turkistan.

Acting in the name of the Society, and by the authority of the Council, I have had the satisfaction of learning that, in virtue of the appeal which I made to the Geographical Society of St. Petersburg, the Imperial Government has sent the requisite order to the Governor-General of Turkistan to offer to Mr. Hayward all aid and assistance, and a free passage through these territories to Europe.

If, then, I couple this gratifying fact with the very successful recent mission of our Associate, Mr. Douglas Forsyth, to the Court of St. Petersburg, in order fully to lay before the Emperor and his Ministers the exact state of affairs in regard to the great region which, on the north-west, lies between British India and the Thian Chan Mountains, which have hitherto been the Russian boundary, I see in these circumstances cause for rejoicing that there is every prospect of a harmony of views between the Russians and ourselves regarding this great region. I rejoiced when I learnt from Mr. Forsyth himself, that both the Emperor and his enlightened Minister, the Prince Gortschakoff, are willing to maintain the boundary of the Thian Chan, and to undertake not to advance the Russian forces into Eastern Turkistan. As I have long suggested that, for the benefit of Britain and Russia, the large Mussulman territory of Eastern Turkistan—now completely independent of China—should be allowed to lie as a neutral region, which may prove thus a source of lucrative trade both for Russia and England, I am the more rejoiced at the present aspect of affairs than in any preceding year. And now that such intervening country is in a well-ordered condition, thanks to the unflinching power of the Ataligh Ghazi, we may look to a durable arrangement and good understanding on this northern frontier of British India.

If a successful trade should be established between British India and Eastern Turkistan, we must ever recollect that the first step

taken in it was the work of our able Associate, Mr. Douglas Forsyth, who, by the transmission of a single horse-load of Indian tea, propitiated the great chief, who is now our ally; and we must all feel much indebted to the present Viceroy of India, the Earl of Mayo, for the warm interest he has taken in sustaining and supporting the enterprises which have led to so desirable a result. It is indeed my pleasing duty to inform the Society that the Viceroy has charged Mr. Forsyth with a special mission to the Ataligh Ghazi, in which he is to be accompanied by Mr. Shaw, who for this purpose has been recently recalled from this country by a telegram from the Viceroy. The friendly intercourse between British India and Eastern Turkistan will thus be permanently settled.

In considering the value of the intercourse between British India and Eastern Turkistan which has recently been brought about, I must not omit to do justice to Sir Henry Rawlinson, who on previous occasions has drawn our attention vividly to the important results which must follow from explorations of our North-Western frontiers. I refer you to our 'Proceedings' for the able delineation, in which, quoting the letters of our accomplished and zealous Associate, Mr. Douglas Forsyth, he places the whole subject before us in a masterly style. Sir Henry Rawlinson's speech, delivered at our first meeting of the past session, is so pregnant with knowledge, and so clear in describing the advances made by our envoy, Hayward, and the other explorers, that I commend you to peruse the report of it in our 'Proceedings,' followed, as it is, by the last speech ever made to us by our ever-to-be-lamented Associate, Lord Strangford, as a compendium of nearly all that can be said upon this broad subject geographically, commercially, and politically.

I have already referred to the fact that the Chinese had held Eastern Turkistan in subjection for about a hundred years; and, indeed, their latest conquest of that country dates only from about the middle of the last century. But it may not be without interest, as an illustration of the great antiquity of the Chinese power, and the vitality that it possessed through a great series of ages, to observe that this was by no means the first time that the regions in question had formed a part of the empire. I learn from Colonel Yule that Chinese scholars date the spread of its influence in that direction from the second century before our era; and in the first century after the birth of Christ the Chinese power extended across the Bolor even to the shores of the Caspian! In the following ages it was subject to great fluctuations; but under the great Thang

dynasty, in the seventh century, the whole of the country east of the Bolor was under Chinese authority; and even west of the mountains, provinces extending to the frontiers of Persia were claimed as subject, and organized, at least on paper, with all the elaboration of the Chinese system. The conquests of Chingghiz and his successors again brought the states of Turkistan under the same supremacy with China. When they fell, the indigenous dynasty which succeeded them in China held little beyond the limits of China Proper; and it was not till the existing Manchu dynasty was in the height of its power that Eastern Turkistan for a third or fourth time, and, probably, for the last time, became united to China. Such a long series of vicissitudes almost reminds one of geological and ante-historical successions and oscillations.

Russians in Central Asia.—Whilst our own countrymen have thus been largely adding to our acquaintance with Eastern Turkistan, the Russians have extended geographical knowledge throughout Western Turkistan, a large portion of which has been all but annexed to the Russian empire, the chiefs of the principal Khanats, still called independent, being to a great extent subordinate.

We learn from the communication of Baron Osten Sacken to the Imperial Geographical Society, that among the most recent of these surveys are those made by Baron Kaulbars in the central part of the Thian Chan chain, on the upper course of the River Narym, and extending to the edge of the country of Eastern Turkistan, *i.e.* from the borders of the Khanat of Kokan to the mountain Khan Tengri, near the western extremity of the Lake Issyk-kul. In ascending the affluents of the Narym, Baron Kaulbars determined that its principal source was a glacier in the mountains of Ak Schirah, on the same meridian as the east end of Lake Issyk-kul. He also explored the grand snowy chains of Sery Yassy and Kok-schul, extending south-westwards to the Valley of Aksai.

The topographical surveys in the district of Zerafshan, under the direction of M. Scobelew, extend from Urmittan for 80 versts up the Zerafshan, in the valley of which river is situated the renowned city of Samarkand. This survey, and the measurement of the elevations of the so-called *Starved Steppe*, between Tschinaz and Disakh, show that that arid tract was formerly enriched by the waters of the Zerafshan, through a grand canal of irrigation of Tartar origin, which may be considered one of the greatest hydraulic works of that formerly energetic people.

Besides other surveys, one of which has extended in the direction of the caravan route from Bokhara to Kasilinsk, the Russian topographers have prepared a map of the whole of Russian Turkistan, on a very large scale. When this document reaches our map-makers, it will doubtless give quite a new geographical face to large portions of Central Asia.

Remains of extensive former brick constructions, found in the great Lake Issyk-kul, were brought to light through the exertions of General Kolpakovsky, and they have excited much curiosity. One of these masses of brick presented on its surface the form of a human figure, and weighed near 500 lbs. Already in 1857 M. Semenof had called attention to some of these ancient ruins, the existence of the places of which they are the remains is recorded in the annals of Chinese history.*

The existence of a city on the north end of Lake Issyk-kul 200 years before Christ, and also the remains of an Armenian monastery having been alluded to by Humboldt, I have no doubt that my friend M. Pierre de Tchihatchef will, in his proposed new edition of the 'Asie Centrale' of that illustrious man, develope still more all the topographical and antiquarian knowledge which has been elicited by the Russians, who thus have brought to light many ethnological data, which, through the long continuance of barbarous Turcoman rule, has remained so long unnoticed.

In terminating these observations on Central Asia, I must again express the gratification I have experienced in witnessing the highly praiseworthy efforts of the Russian geographers to lay open to the world of science the true physical features of the vast region of Western Turkistan, of which they are now, to a great extent, the rulers. In former years, I have alluded to the labours of Semenoff, Struve, and others, and very recently we have received an excellent translation, by Mr. Delmar Morgan, of a very remarkable memoir by Baron Osten Sacken, describing the mountainous region between Turkistan and the Russian boundary near Kashgar, the result of an exploratory expedition by General Poltoratsky, when accompanied by Baron Osten Sacken himself. The clearness and spirit of this memoir are such, that a sketch-map might almost be constructed from the author's word-painting; whilst the description of the flora of this highly-diversified country, and its analogy to the flora of the Himalayan mountains, will be highly appreciated by all botanists.

* See the 'Mittheilungen' of Petermann, 1858, p. 360.

Such a work, independently of other obligations conferred on us (and especially by his kind intervention, which procured the promise of the Russian Government that our envoy, Mr. Hayward, should be well received if he penetrated into Western Turkistan), influenced our Council in unanimously electing Baron Osten Sacken, the Secretary of the Imperial Geographical Society, as one of our Honorary Corresponding Members, of whom we may well be proud.

The day, indeed, has now arrived, and to my great delight, when the Russian Imperial Government on the north, and the British Government on the south, are rivals in thoroughly exploring and determining their respective frontiers, leaving between each dominion wild tracts, which will probably be for ever independent, but whose chiefs will well know how to respect their powerful neighbours.

These geographical operations are also, I doubt not, the forerunners to the establishment of good commercial intercourse, and are, I venture to think, the surest pledges of peace.

In the discussion which followed the reading of the memoir of Baron Osten Sacken, I was most happy to find that my eminent friend, Sir Henry Rawlinson, completely coincided with the views on this point which I have long entertained. It was also a source of true pleasure to me that, at the same meeting, the Chancellor of the Russian Embassy in London, M. Bartholomei, was a witness of the sincere expressions of gratification we all experienced in seeing the cordial and unreserved communication which now happily exists between the geographers of both countries. The earnest and graceful manner in which the Russian diplomatist addressed us was, I am happy to say, duly appreciated by the assembly.

WESTERN ASIA.—In dwelling upon the advances in geographical knowledge which have been made in Central Asia, we must notice in a marked manner the journey of Mr. Consul Taylor to the sources of the Euphrates, as communicated in a letter to Mr. T. K. Lynch, and published in our 'Proceedings.'* The line of exploration taken by our enterprising and learned Associate, Mr. Taylor, was intermediate to the routes taken by previous travellers, for he proceeded from the north of Lake Van, between Diadeen and Beegir Kalah. By following this line, Mr. Taylor

* See 'Proceedings,' vol. xiii., p. 243.

ascertained that this region, so replete in ancient times with igneous action, is still the seat of an active volcano and many hot sulphureous springs and geysers, besides valleys which have been well filled with basalt, and subsequently deepened into abrupt gorges with precipitous sides.

AUSTRALIA.—Of the recent explorations in Australia it is right to observe that the expedition of Mr. Forrest in the interior of Western Australia, where he penetrated to E. long. 122° 45', though productive of no great geographical results, was zealously conducted, in the hope of tracing some account of the bodies of certain white men who had been heard of, and which were supposed to be the remains of Leichhardt and his associates. No clue, alas! was found to identify this report, but a large additional area of salt lagoons and pebbly and sandy beds was added to the Western Colony. The feature which comes out strongly in these tracts is, that whenever granite rocks appear, water is in much greater abundance than in the sandy tracts.

As to the great mass of land forming the northern part of Australia, which, as geographers, we have termed North Australia, in distinction to South-west and East Australia, the new data that have come to our knowledge are of comparatively slight importance. For although considerable tracts on the northern sea-board opposite to Melville Island are found to be well grassed, and will ultimately, perhaps, be capable of occupation, the efforts which have been made by the inhabitants of South Australia to annex and settle in them have not been fortunate.

These subjects have recently been well illustrated by our Associate, Sir Charles Nicholson; but the chief merit of his communication, as recently given to us, consisted in the clear comparative sketch of the rise and progress of the several great Australian colonies, and the remarkable explorers they have produced.

To myself this general sketch was very refreshing, inasmuch as nearly all the adventures he traced have been dwelt on, in more or less detail, at the meetings of the Royal Geographical Society since our foundation in the year 1830. From that time we have seen little Port Phillip, then a mere dependency of New South Wales, rise into the grand and wealthy colony of Victoria; Port Adelaide become South Australia; the Moreton Bay, or northern settlement of New South Wales, expand into the grand and intertropical colony of Queensland. This general view is the more valued as

coming from one of our Fellows who occupied for many years the high post of Speaker of the House of Representatives at Sydney. But we have also to thank Sir Charles Nicholson, not for the first time, for having incited geographers to explore and do some real work in that vast region of New Guinea which lies between our northernmost Australian settlements and the rich islands of the Malay Archipelago.

Judging from the little we as yet know of the southern portion of this vast equatorial *terra incognita*, that is, the country on the south-west, it is inhabited by ferocious and savage natives, and the climate appears unfavourable to Europeans. My lamented friend, the late Mr. John Crawfurd, so well versed in the eastern Archipelago, lost, indeed, no opportunity of recording his decided objection to an attempt at colonization in any part of New Guinea. But, after all, when we consider the high probability of a rising commercial intercourse between Cape York and other parts of North Australia, particularly those in and around the Gulf of Carpentaria, with the British Indian settlements, it must be admitted that the future interests of Britain would be greatly damaged if any other Power were to possess itself of the south-eastern shores of New Guinea, or make any settlement whatever in our own territories of North Australia.

By recent intelligence from Australia, it appears that the Papuans are not so irreconcileably hostile to Europeans as previous accounts would lead us to believe. Mr. Chester, the Police Magistrate at Somerset, our new settlement at Cape York, reports that Captain Delargy, of the trading schooner *Active*, engaged in the *bêche-de-mer* fishery, whilst in search of a missing boat in the month of August last, was induced to try the hospitality of the natives of the south-eastern shore of New Guinea. He had a large and well-armed party with him, and was met on the beach by about 100 warriors armed with bows and arrows, who ranged themselves in order of battle; but on his making peace demonstrations, the Papuans laid aside their bows and vied with each other in showing hospitality to the strangers. They prepared a sumptuous feast of pigs, yams, taro, and a kind of jungle fowl, and sent a portion on board the boats for those who remained in them. The chiefs, after the feast, accompanied Delargy through their village, and the most friendly relations were established. In communicating this very interesting information to me, Sir Charles Nicholson suggests that our own Admiralty might be recommended, after this proof of friendliness on the part of the

Natives, to employ the vessel of war on the Cape York station in an attempt to improve our geographical knowledge of this wonderful island, and cultivate amicable relations with its spirited inhabitants.

SOUTH AMERICA.—Since my last Address, the account of the exploration of the River Juruá, by Mr. Chandless, to which I then alluded, has appeared in the 'Journal' of the Society, accompanied by a map, drawn by that enterprising and painstaking explorer, with his usual completeness of topographical detail. This memoir, and the map appended to it, was sent by him from Manaos, on the Rio Negro, from which place he afterwards sailed to explore another great tributary of the Amazons, the River Madeira. It was his intention, on this journey, to explore the large westerly affluent of the Madeira, the Beni, up to its sources in the Andes of Southern Peru, and thus set at rest the vexed question of the course of the Madre de Dios; but his attempt to penetrate into this difficult region was not rewarded with his usual success. The country on the banks of the Mamoré and Beni rivers was almost impassable, owing to the hostility of a tribe of wild Indians, who attacked the canoe of one of Mr. Chandless' travelling companions, and killed its owner with several of the crew. We now learn, for the first time, that an expedition sent by the Bolivian Government in 1846 to explore the Beni, and consisting of thirty-two well-armed men, besides canoe-men, was driven back by the wild Indians. Besides this formidable obstacle, it was found next to impossible to hire civilised Indians for the journey. Nothing daunted, however, our traveller entered the Beni with his canoe and small party of seven men, and ascended the little-known stream as far as a rapid, 14 miles from the mouth, which he was unable, with his weak party, to pass, and re-descended the Madeira to the main Amazons. A curious feature in the physical geography of the interior of South America is brought to light by the researches of Mr. Chandless, and those of the Peruvian and Brazilian Boundary Commission, in which Senhor Paz Soldan was engaged. This is, that all the chief southern tributaries of the Amazons, between the Madeira and Ucayali, flow nearly parallel to the main stream, and have exceedingly tortuous courses; showing that the western interior of the South American continent consists of a vast nearly level plain, sloping gradually from west to east, and with very little slope from the south, towards the centre of drainage.

In other parts of South America explorations and surveys are

being carried on, by the various States, with more or less activity. The Government of Brazil, as we are informed (through Mr. Chandless) by Senhor Pereira de Andrada, Secretary to the Brazilian Legation in London, have appointed an Imperial Commission to draw up a general map of Brazil, in which the costly surveys lately carried out along the great rivers of the empire will be utilised; and the Commission has offered to the Society copies of the maps and official reports on which their great work will be founded. According to the information which Mr. Chandless has received from the same quarter, an intrepid missionary of Bolivia, Padre F. Samuel Mancini, made an exploration of the River Madre de Dios, in the years 1868 and 1869, from the farthest point reached by Lieutenant Gibbon to the junction of the river with the Beni, and has proved that the course of the river is to the south of that of the Purus, of which it had formerly been considered the head-waters.

Further north, a scientific expedition, under the auspices of the Smithsonian Institution of the United States, has explored, with good results, a large portion of tropical South America. An account of one part of the expedition has recently been published by Professor Orton, who, with his companions, descended the eastern range of the Andes from Quito, and made his way, through the dense forests of the Napo and its tributaries, to the head of canoe-navigation on these rivers. The most important result of this journey appears to be a careful barometric measurement of heights, from the Andes, down the valley of the Amazons, to the Atlantic.

The Government of Chili, which has always honourably distinguished itself by the promotion of scientific investigation and the publication of the results in the completest manner, is now preparing a map of its central provinces on a scale of 1 : 250,000, embracing the most populous portions of the country, from the River Copiapo, in 27° 20′, to Angol, in 37° 48′ s. lat. Besides the official surveys, however, much useful geographical work is being accomplished in Chili by independent scientific explorers—amongst whom our Honorary Corresponding Member, Dr. R. A. Philippi, is one of the most active—who are gradually clearing up the doubts which have long hung over the position of mountain ranges, passes, and the courses of streams in the less-known parts of the Republic.

At the southern extremity of America our own Naval Surveyors have been well employed during the past three years in completing the examination of those intricate and difficult passages of the Straits of Magellan which occupied King and Fitzroy years ago in

the voyage which has been made classical by the pen of Mr. Charles Darwin, who sailed in the *Beagle*, one of the vessels, as Naturalist. The commander of the Expedition which has recently returned from the Straits—Captain R. C. Mayne—gave an interesting account of the survey in a Paper read before the Geographical Section of the British Association at Exeter, and described more particularly the narrow passages leading northward from the western end of the Strait, which was carefully surveyed with a view of rendering safe an interior route towards Valparaiso, free from the heavy seas of the open Pacific. The work of the survey which Captain Mayne commanded, in the *Nassau*, commenced in December, 1866, and ended last May.

Arctic and Antarctic Researches.—The last year has been altogether unproductive of any explorations of the Arctic or Antarctic regions. The spirited expedition of Mr. Lamont, undertaken at great cost, and which proceeded in the summer of 1869, to the coasts of Spitzbergen, entirely failed to penetrate to the eastern side of the islands, from the unusual severity of the season and the enormous increase of sea-ice.

In regard, however, to Antarctic researches, we have been reanimated by a well-reasoned memoir by Captain Hamilton, R.N. He discussed the superior advantages which the use of steam-vessels in the wide Antarctic Ocean would give us, as compared with their utility in the Arctic Seas, and gave us a very able analysis of a work by a Mr. Morrell, of New York, which may now be said to have been thoroughly discussed for the first time; for, though a copy of this rare work existed in our library, no one had published any account of the curious information which it contained regarding high southern latitudes. When in command of a small schooner, Mr. Morrell described himself as having traversed the Antarctic Ocean to a greater extent than any other navigator, in the most rapid manner, and this before the voyages of Commodore Wilkes and Sir James Ross! Comparing the accounts of the successive Antarctic researches with each other, Captain Davis, an Antarctic explorer himself, was of opinion that great scepticism must prevail as to the authenticity of this work. It would appear, indeed, that our revered authority, the late Admiral Sir F. Beaufort, rejected Morrell's story as spurious; and, in truth, the vast spaces traversed with such rapidity, and the absence of all allusion to Wilkes's Land and Sabrina Island, which the voyager is stated to

have approached, induce me to consider the work to be an ingenious Robinson Crusoe tale, fortified by some striking geographical data.

The author's exaggerated description of birds and vegetation in some of the parts visited (Auckland Islands, &c.)—productions which only exist in tropical regions—seems to demonstrate the unsoundness of the narrative regarding many parts said to have been visited.

A few more words on Physical Geography as dependent on Geology.—In the Address of last year I endeavoured, as a geologist, to define the great extent to which the present outlines of land had been determined by internal elevatory forces at various periods, by which the earth's crust was not only broken, upheaved and depressed, but was, consequently, subjected to enormous denudations. Referring you to my former disquisition, I revert for a moment to this topic to make a few additional observations on a memoir which is now published in our 'Journal.' Accounting for the formation of fjords, cañons, and benches in North America, the author, Mr. Robert Brown, has faithfully and well described these openings which he has seen in the crust of the earth; but I take leave to express my disbelief in his explanation of the manner in which he refers them to agencies like those which now prevail. Seeing the existing fjords of North America occupied by great icebergs which have descended from glaciers, and also seeing the sides of the precipitous flanks of these fjords striated and polished by ice-action, he rushes to the conclusion that these enormously deep and broad cavities have been excavated entirely by the action of ice. This, however, is a hypothesis which rests on no sort of evidence. To disprove it, I ask, where in any icy tract is there the evidence that any glacier has by its advance excavated a single foot of solid rock? In their advance, glaciers striate and polish, but never excavate rocks.

Again, in explaining the origin of those remarkable cañons in the limestone mountains of North-West America, in which rivers flow for great distances, he infers that such cavities have been entirely worn out by the waters which flow through them, and which were formerly of vastly greater dimensions.

Now, in both these cases I think the writer errs. The plain and unmistakeable geological, and, therefore, geographical fact, is, that wherever the earth's crust was broken up from beneath, it necessarily underwent great transverse cracks, which opened into fissures and caverns; and these openings, made at different times,

were then left to be operated upon in subsequent ages by all the waters which fell upon the surface, or by rivers above and below that surface, to be by them abraded and fashioned.

The true origin, however, of all such great transverse fjords or cañons, or, in short, of all abrupt fissures in hard rocks into which bays of the sea enter, or in which rivers flow, was never produced by such sea or river, but must be referred to original breaks in the crust, of which the waters have taken advantage, and have found the most natural issue.

Again, in illustrating this subject, Mr. Brown refers the origin of the great "benches" or banks of *débris* at various altitudes of North America to a letting off of waters from higher levels: on the other hand, I consider them to be distinct proofs of a subterranean upheaving of the land by which former lakes were desiccated, leaving their shores in the form of ledges or shingle-benches.

The author uses a phrase which, after all, implies an admission of my own view, when he writes: "These breaks may have been (indeed no doubt were) assisted by the volcanic disturbances which at a comparatively late period seem to have riven all the country in that region, and volcanoes in the mountains, through which these rivers flow, were the active agents of disruption."*

The author farther seems to me to demolish the theory of modern causes by showing that the channel of the Golden Gate at San Francisco has a maximum depth of 50 fathoms, which great chasm he shows is in the line of the axis of the elevation of the main chain.

How, then, with the plain evidences of the origin of such vast fissures by pure geological subterranean agency, is it possible to refer them to the superficial action of ice and rivers, which, geologically speaking, are modern agents, and have only modified the old breaks and cavities of geological times?†

* *See* 'Proceedings of the Royal Geographical Society,' vol. xiii., No. 3, p. 148; and 'Journal of the Royal Geographical Society,' vol. xxxix., p. 125.

† Since the above was written, I have found that a paper on this subject by Mr. J. W. Tayler, a gentleman who has spent the greater part of the last 18 years in Greenland, has been communicated to the Society, and will be published in the 2nd Part of the 'Proceedings' for the present session. In this paper Mr. Tayler combats the views of Mr. Brown, and declares, as the result of his examination of the fiords themselves, that glaciers, instead of excavating fiords, are continually filling them up. He adds that some of the largest glaciers, as that north of Frederickshaab, do not exist in fiords at all. As a conclusive argument, he gives a diagram of a fiord south of Akust, having two arms, which could not possibly have been cut by a glacier.

AFRICA.—*Great Salt Desert at the Eastern Foot of the Abyssinian Alps.*—In former allusions to the structure of that grand eastern edge of the Abyssinian highlands along which the British army advanced, no sufficient notice has been taken by myself of a very remarkable journey made by Mr. Werner Munzinger in exploring the route which leads from Hanfila on the Red Sea to the Abyssinian highlands. A brief account of this adventurous trip was given in our 'Proceedings,' and the narrative *in extenso* is now published in our 'Journal.' The lower country passed over appears as if it had been raised up from the Red Sea itself, for it consists of coral-reefs, sandy and shelly deposits, enlivened only with a few palm-trees, and containing in its central part a vast basin of salt which lies below the level of the sea. This is the country of the Afars, who occupy a triangular tract the apex of which is Annesley Bay. Volcanic rocks abound in it, and rise into mountains at its southern end.

All the streams which descend from the Abyssinian Alps to the east are absorbed in the low sandy region, the evaporation from which, under the great heat which prevails, accounts for the desiccation.

Mr. Clements Markham has borne ample testimony to the admirable manner with which Mr. Munzinger executed the arduous duties assigned to him, whether as an explorer penetrating far into the interior of Abyssinia, or in accompanying Colonel Grant on his mission to the chief of Tigrè at Adowa, or again in reconnoitring to within sight of Theodore's army at Dalanta, far ahead of the advanced posts of the British army.

In making these references to Mr. Munzinger, who is a distinguished Swiss naturalist, I am glad to find that the Queen has rewarded his services by conferring upon him a Companionship of the Order of the Bath.

DR. LIVINGSTONE.—Throughout the past year we have been kept in a state of anxious suspense respecting the position of our great traveller, Livingstone; and I grieve to close this Address without being able to offer some encouraging sentences on the prospect of speedily welcoming him home. At the same time, there is no cause for despondency as to his life and safety. We know that he has been for some time at Ujiji, on the Lake Tanganyika, whence he wrote home on the 30th May last, though unable to make any movement for want of carriers and supplies. These were, indeed,

forwarded to him by Dr. Kirk from Zanzibar, when alas! an outbreak of cholera stopped and paralyzed the relieving party. Recent intelligence, however, has reached the Foreign Office to the effect that the pestilence had subsided to so great an extent, that we may presume the communication between the coast and Ujiji has before now been re-opened.

The work which still lies before Livingstone has been often adverted to, and it is hoped that he will live to advance to the north end of the Tanganyika, and there ascertain if its waters flow into the Albert Nyanza of Baker. If the junction should be proved, we may indulge the thought that, informed as Livingstone must now be of the actual carrying out of the great project of Sir Samuel Baker, he may endeavour to meet his great contemporary. The progress of the great Egyptian expedition of Baker having been delayed in its outset, we know that it only left Khartoum to ascend the White Nile in February. After reaching Gondokoro, as was expected to be the case, in the first days of March, some time must necessarily elapse in establishing a factory above the upper rapids, and beyond the tributary Asua, where the steam-vessels are to be put together before they are launched on the Nile water, on which they are to pass to the great Lake Albert Nyanza. As soon, however, as a steamer is on that lake, we may be assured that Baker, with his well-known energy and promptitude, will lose not a moment in the endeavour to reach its southern end, in the expectation of there giving hand and help to Livingstone. Let us therefore cherish this cheering hope, which would indeed be the most happy consummation our hearts can desire.

The British public will be much better informed than they have been on this subject when they examine a recent small work by Mr. Keith Johnston, jun. In this pamphlet the author has given a succinct history of all the explorations in South Africa, and has also put together from the best authorities (Petermann and others) a map which shows clearly to what extent the rivers which flow from the southern highlands, on the south and s.s.w. of Lake Tanganyika, are for the most part independent of that lake, and may prove to be tributaries of the Congo. On the other hand, the streams which enter the Lake Tanganyika through the Lake Liemba of Livingstone, are probably the ultimate sources of the Nile itself, while the Kassi and other streams which feed the Lakes Bangweolo and Moero may be found to issue in the Congo.

If this last hypothesis should prove to be true, the waters of

which Livingstone has been the first to explore will be found to be the sources both of the Nile and the Congo. As respects the Nile, however, my sagacious friend must feel that, until he proves that some of these waters of the Tanganyika flow into the Albert Nyanza, the problem in regard to the Nile remains unsolved.*

In the mean time the Nile hypothesis of Mr. Findlay and others (that the Lake Tanganyika will be found to unite with the Albert Nyanza) is, according to the now estimated relative altitudes of these southern waters, the most probable. God grant that the illustrious Livingstone may demonstrate this to be the case, and that we shall soon see him at home as the discoverer of the ultimate sources of both the Nile and the Congo.

On this important and exciting subject it is gratifying to state that our Medallist, Dr. Petermann, has laid down, on a general map of South Africa in the last number of his 'Mittheilungen,' that which he terms a chronological sketch of all Livingstone's wonderful and arduous travels from 1841 to 1869. In respect to the tributaries of the Congo, the map of Petermann differs hypothetically from that of Mr. Keith Johnston, jun., inasmuch as he indicates that the waters of the Bangweolo, Moero and Ulenge lakes probably point to north and by east; and, if this should prove to be the case, they also will fall into the great Albert Nyanza of Baker.

In concluding the consideration of this absorbing topic, I rejoice to be enabled to state, that in consequence of my representing to Lord Clarendon the isolated position of Livingstone at Ujiji, where he was without carriers or supplies, whilst he was, comparatively, near his ultimatum, the north end of the Lake Tanganyika, Her Majesty's Government have kindly afforded the means whereby the great traveller may be effectively relieved before he returns to his admiring country.

Conclusion.—At the last anniversary I was placed in this chair for the usual term of two years, and, in thanking my associates for this repetition of their never failing kindness, I informed them that, if at the end of the first of the two years I should be incapacitated by infirmity, I flattered myself they would allow me then to retire, with thanks for my long continued devotion to their cause. I also

* As an ardent young geographer, Mr. Keith Johnston, jun., lays it down too broadly on the title-page of his clever work, that the sources of the Upper Nile basin are settled. Granting that this is not only the hopeful, but also the probable solution of the question, the ultimate proof, as stated above, is still required, and on that proof being obtained the return of Livingstone depends.

said that I accepted the office in the ardent hope that my dear friend Livingstone might soon return to us, so that I might have the joy of presiding at the national festival which would then unquestionably take place in his honour.

Although the first of my two years of office has passed without this happy realization of my hopes, I trust that before our next annual meeting the great traveller will have determined the grand problem of the ultimate southern sources of both the Nile and the Congo; and if I live to witness this completion of my heartiest aspiration, I will then take leave of you in the fulness of my heart, and with my warmest thanks to you, my friends, the Fellows of this Society, who have so long and so kindly supported me.

PROCEEDINGS

OF

THE ROYAL GEOGRAPHICAL SOCIETY.

[Issued November 10th, 1870.]

SESSION 1869-70.

Fourteenth Meeting, 13th June, 1870.

Sir RODERICK I. MURCHISON, Bart., K.C.B., President, in the Chair.

Elections.—*J. Dentry, Esq.; W. Thomas Greenup, Esq.; James Pimblett, Esq.; W. R. Sheldon Ralston, Esq.*, M.A.; *J. Hyde Sparks, Esq.*

Accessions to the Library from 9th May to 13th June.—'Voyage à l'Amerique Septentrionale.' Par Le Marquette et St. Joliet. Paris, 1781. Donor W. D. Cooley, Esq. 'Half Round the World.' By Viscount Pollington. 1867. Donor the author. 'Instructions nautiques pour la Baie de Fundy.' Par G. F. Macdougal. Traduit par J. La Font. Paris, 1869. 'Instructions nautiques pour la Navigation de la Côte Ouest d'Ecosse.' Par M. Frickman. 'Sur la Nouvelle Caledonie.' Par MM. Chambeyron et Danaré. Paris, 1869. 'Pilote des Côtes Ouest de France.' Par Bouquet de la Grye. 'Pilote de Terre Neuve.' Par G. C. Cloué. 2 vols. 'Routier des Côtes N. O., Ouest et Sud d'Espagne.' Par Le Gras. 'Description des Côtes du Royaume de Portugal.' Par Le Gras. 'Essai sur l'Atterrage et l'Entrée de la Rade de Brest.' Par M. H. de Roujoux. 1868. 'Pilote de la Mer Noire.' Par H. de la Planche. Paris, 1869. 'Etude sur les Ouragans de l'Hemisphere Austral.' Par M. Bridet. Paris, 1869. 'Annuaire des Marées des Côtes de France.' Par R. de Genouilly. Paris, 1869. 'Annales hydrographiques.' Par Le Gras. Paris, 1869. 'Catalogue chronologique des Cartes,' etc. 'Catalogue par Ordre Géographique.' Paris, 1869. 'Sur les Sondes.' Par J. E. Davis, R.N.

Traduit par M. Bonquet de la Grye. Paris, 1869. Donor of the above, Depôt des Cartes et Plans de la Marine. 'The Mineral and other Resources of the Argentine Republic in 1869.' By F. J. Ricard, 1870. Donor the author. 'La Ligne Militaire du Syr-Daria.' Par T. Lobysevitsch. St. Petersburg, 1865. Donor R. Michell, Esq. 'Physical Geography.' By Mrs. Somerville. Revised by H. W. Bates. 1870. Donor H. W. Bates, Esq. 'Tutor to Astronomy and Geography, 1674.' By Joseph Moxon. Purchased. 'Germany in 1677.' By E. Brown. Purchased. 'Translation from an Arabic MS., Grand Cairo to Mount Sinai, 1753.' By R. Clayton. Purchased. 'Remarks on the Abyssinian Expenditure.' By J. C. Hoseason. Donor the author. 'Persia in 1633.' *Ex Officina Elzeveriana.* 'Russia, 1633.' *Ex Officina Elzeveriana.* Donor John Power, Esq. 'Papers relating to the U.S. Survey of Central America, 1869-70.' Donor John Power, Esq. 'Arran Island, 1807.' By J. Headrick. Purchased. 'Collection of Voyages by the Portuguese and Spaniards in the 15th and 16th Centuries.' Purchased. 'Opuscula.' By R. G. Latham. 1860. Purchased. 'Cape of Good Hope in 1731.' By Peter Kolben. Purchased. 'H.R.H. the Duke of Edinburgh in India.' By J. Fayrer. Calcutta, 1870. Donor the author. 'Reisen in Ost-Afrika.' By C. von der Decken. 4th vol. Leipzig, 1870. Purchased. With the usual contributions from Learned Societies and Publishers.

ACCESSIONS TO MAP-ROOM SINCE THE LAST MEETING OF MAY 9TH.—Chart of Spitzbergen, showing the route of the Swedish Expedition of 1868, and other Arctic voyages between Greenland and Spitzbergen. Presented by Professor Nordenskiold. Panoramic Chart of a proposed Canal through the Isthmus of Darien. By M. L. de Puydt. 1866. Presented by the author. 4 copies. 856 sheets of the Ordnance Survey of England and Wales, on various scales. 24 Admiralty Charts. 156 French Charts, and 24 Books of Pilotage.

The PRESIDENT, before proceeding to the consideration of the papers that were to be read, explained to the meeting the nature of the succour that had, to the great credit of the Earl of Clarendon and Her Majesty's Government, been sent to Dr. Livingstone. There had been much misapprehension on the matter, judging from the numerous applications he had received from active young men anxious to go in search of Dr. Livingstone, it being supposed that there was an expedition about to start for that purpose from this country. No such expedition had, however, been intended. Dr. Livingstone had been more than three years and a half in the heart of Africa without a single European attendant. He (the President) was not sure that the sight of an unacclimatised young gentleman sent out from England would not produce a very bad effect upon the Doctor, because in addition to his other labours he would have to take care of the new arrival. He had therefore to announce that the 1000*l.* which

the Government had given will be sent by Mr. Churchill, the Consul of Zanzibar, who happens, accidentally, to be in this country, and who is going out immediately. He will instruct Dr. Kirk to fit out a similar expedition to that which started last year, but which was impeded by an attack of cholera. The epidemic has greatly subsided, and the only difficulty now is to get to Ujiji, where Dr. Livingstone was when last heard of, unable to move forwards or backwards for want of carriers and supplies. It will take two months or more for these supplies to reach Ujiji from Zanzibar, therefore all anxiety must be put aside for months to come. In about seven or eight months good news might be expected, and soon after that he (the President) hoped we might see our friend again in his native country.

The following Papers were then read :—

1.—*Travels in Western China and Eastern Thibet.*—By T. T. Cooper.

The writings of that gallant officer and gentleman, Captain Blakiston, who first explored the Upper Yang-tsze River, leave me but little to say on the part of my journey relating to the Yang-tsze Kiang. I shall therefore take my starting point from Ta-tsian-loo, the border town and Customs Station of Western China.

I was detained here more than three weeks by the difficulty of procuring competent interpreters, and mules and ponies to serve as baggage animals. At last, having completed all my arrangements, I left the little border town on the 30th day of April, 1868, taking with me a good store of food, consisting of Chinese hams, flour, Thibetan butter, and a liberal supply of brick tea, with beads, needles, and thread, for barter; as beyond this point a handful of tea, a few needles, or a few yards of white or blue thread, are of more value than gold, silver, or copper coin; indeed, the latter are useless, while Sycee silver and rupees are only exchanged at a considerable loss.*

Leaving behind us the magnificent gorge of Ta-tsian-loo, with its perpendicular walls of mountains, we followed up the stream, which flowing through it joins the Ta-tow-ho at the foot of the gorge; by noon we had reached the summit of the Jeddo range of mountains, which may be said to form the great natural wall of Western China. The toilsome ascent through a bleak country, covered with irregular masses of grey sandstone, blackened by time and weather, was amply rewarded by the splendid view which greeted us on reaching the topmost ridge; below us to the west gigantic wave-like mountains, covered with grass, rolled in vast masses for miles, as far as the eye could reach, without the vestige of a tree or shrub on them, but dotted here and there with herds of yaks and sheep; while a back-

* My party consisted of two interpreters, for the Chinese and Thibetan languages, and a mule-driver.

ground of snowy peaks, apparently of great height, completed the grandeur of the spectacle.

Descending into the grassy valley which lay stretched at our feet, a few miles brought us to our resting-place for the night at one of the Government courier stations, which occur at intervals of ten miles from Ta-tsian-loo to Lassa, the capital of central Thibet. Two days' journey through this grassy valley, bordered by mountains some three or four thousand feet high, brought us to the village of Tung-olo, where we were detained for two days by snow, which fell very heavily on the night of our arrival, rendering the pass over the Tung-olo Mountains (at the foot of which the village lies) impassable. We found the Thibetan people here very kind and hospitable; there were a great number of Chinese half-breeds, but only two real Chinamen, one a blacksmith and the other an old soldier, whose duty it was to look after the courier-post. On the morning of the third day after our arrival, some shepherds from the mountains reported the pass safe, and shortly after daylight we made a start, and reached the snowy summit of Tung-olo about midday. We found the snow from three to four feet deep, and the sun's rays reflected from it obliged us to bandage the eyes of our mules and ponies, while the air was so rarified that breathing was quite a painful labour. From this point two days' journey brought us to the little town of Hokow, situated on the left bank of the River Yarlong, a tributary of the Kinchar or Yang-tsze River. Our road led us through a wild mountainous country, in which at times we crossed high rugged mountains, and then descended through magnificent pine-forests into beautiful fertile valleys, dotted here and there with the flat-roofed houses of Thibetan cultivators, whose fields were green with spring crops of bearded wheat and white peas, and invariably planted round with fine old walnut-trees, few countries in the world perhaps growing finer walnuts than the valleys of Thibet.

Opposite the town of Hokow the River Yarlong runs for about four hundred yards in a deep unbroken stream, the milky hue of its waters bearing evidence of the limestone mountains, whose torrents feed it on the way from its source in central Thibet. This spot affords the only place for a ferry that occurs for miles, as both above and below the channel is broken by falls and rapids.

The means employed for ferrying over brick-tea on its way to Lassa are somewhat novel; large circular baskets, six or eight feet in circumference, are covered with green hides, which, when laden, float lightly on the water; and presenting but little obstruction to the current, are easily paddled over by the Chinese half-breeds, who are exclusively employed on this work.

For the convenience of travellers of distinction (who have passports from the civil officer at Ta-tsian-loo) large boats are provided in which their baggage, mules, and ponies are taken over.

From Hokow it is four days' journey to Lithang, a Chinese and Thibetan military station, famous for its gold-roofed Lama monastery, containing about 3500 Lamas. The country travelled before reaching Lithang is wild, but abounds in beautiful scenery. Occasionally, as we struck some deep valley, our road lay through forests of wild tea-trees, white with their convolvulus-like flowers. At other times our path was lined with wild gooseberry-bushes, laden with blossom; then leaving these pleasant spots, the road would lead us up the side of steep mountains covered with a thick forest, affording shelter to numerous herds of deer; the stillness unbroken, save by the bells of our baggage animals, or the occasional report of some hunter's gingall, repeated by answering echoes through the gorges. After descending from the bleak summits of these mountains, the heat of the valleys was most oppressive, and affected us with a painful lassitude; unfortunately, my thermometer—the only instrument I had ventured on taking with me—had been broken in ascending the Yang-tsze Rapids, and I was unable to record the changes of temperature.

Lithang is situated on a high grassy plateau, surrounded by mountains of perpetual snow; and indeed the whole country from Ta-tsian-loo, gradually increasing in elevation, seems at this point to reach a climax. Not a sign of vegetation beyond grass is to be seen; and the town, built on the plains at the foot of the mountains, and surrounded by a wall, stands out, making the nakedness of the country still more marked, reminding one of the cities seen along the shore of the Gulf of Cutch. The traveller could almost fancy he was entering some great city of the dead, for all is quiet; no sounds break the stillness save the distant mournful tones of the Lamas chanting their prayers; while high overhead the lazy Turkey buzzards and huge croaking ravens sail in circles over the city, ready as it were to swoop down and gorge themselves on dead humanity. On entering the city one is immediately struck by the solemn air of the people. Numbers of Lama priests are to be seen dressed in flowing garments of green cloth, each devoutly twirling his prayer-wheel, and muttering the great Thibetan prayer of 'Om Mani Padmi hum:' but not only amongst the Lamas is this solemnity of demeanour noticeable; even the rough tea-traders and townspeople, dressed in their sheepskin coats, carry prayer-wheels, which they constantly twirl and join in the universal cry of "Omani peminee, omanee peminee!" which, with one exception in the case of a great Lama from Lassa, was the only way in which I heard the

prayer of 'Om Mani Padmi hum' rendered during my travels in Eastern Thibet; and none of the people or Lamas could translate their prayer to me in any other words than "Glorification of the Deity."

After a day's rest, I was glad to leave Lithang, not only because of its great altitude and rarified air, which rendered breathing an act of pain, but also on account of the excitement my arrival caused amongst the Lamas, who (taught by the Chinese) looked upon my coming as the forerunner of the annexation of their country by the Palin or white Conquerors of India, and met me everywhere with scowls of hatred, and muttered curses. I, however, visited their monastery alone, and without molestation either from them or the great crowd of people which followed me.

I was much struck by the physique common amongst the people of Lithang, which I did not notice in other parts of Eastern Thibet, where the people are mostly tall in stature, with a profusion of black hair hanging over their shoulders, while their complexion is a very dark brown; but many of the Lithangites are thick sturdy fellows, with short woolly hair, and lighter complexion, forming a great contrast with the general appearance of the Eastern Thibetans.

During our stay in Lithang I discovered that our Thibetan interpreter had been systematically plundering my packages of tea, beads, &c. I therefore discharged him. I may here add that the loss of his services did not entail much inconvenience, as our muleteer spoke Thibetan and Chinese; and, besides, we usually found some one acquainted with Chinese in the Thibetan villages.

We left next morning in rather low spirits (as we had not been able to add much to our stock of provisions, which were now very low), and, accompanied by two half-bred soldier spies, crossed the plain, and ascended the snowy range opposite the town; a more truly wild country than these mountains present is impossible to conceive; vast masses of quartz and granite lay scattered over the sterile surface. The huge masses of grey granite piled one on top of the other, rise into gigantic broken pyramids, crowned with snow, the melting of which caused a thousand tiny streams to trickle across our path, in the sands of which, as the hoofs of our cattle ploughed them up, we saw abundance of scaly gold, tempting the unsuspicious traveller to stop and gather the treasure. But gold, like all else of a yellow colour in Thibet is sacred to the Grand Lama; at least, so the two spies informed us; and I was forbidden even to take up a handful of the golden sand.

We travelled for five days' journey through such a country as I have described, pinched by cold and hunger, to the foot of the

Taso Mountains of perpetual snow. During four days out of the five we suffered very much from hunger, as our stock of flour, which was all but exhausted before leaving Lithang, scarcely allowed us six ounces per day; and our two remaining hams were discovered, on cutting into them, to be useless, the flies having got at them. Our horses and mules, beyond a pint of peas per day, had nothing to eat (for the mountains did not produce a blade of grass), and were a source of great anxiety to us. At the end of the first day from Lithang we put up for the night in a courier's hut, built on the summit of the mountains, and half-buried in snow and ice. It was a little place, about 24 feet square, built of mud and stone, and in it the courier, his wife and two grown-up children, myself and two interpreters, the two soldier spies, a cow-yak, and calf, two of my ponies, and two belonging to the courier—making in all nine persons, four ponies, a cow and a calf—pigged it out for the night; and beyond the ravenous attacks of vermin (whose power of tormenting, however, soon gave way before the fatigue of travelling in these mountains) we slept comfortably, and, above all, warmly.

The ascent of Taso was dangerous and exhausting to our already weak baggage-animals, who laboured over the snow, resting at every ten paces, with their noses to the ground and tongues out, gasping for air; while both my interpreter and myself suffered acutely from the rarefaction of the atmosphere, and drew breath with difficulty, the blood flowing from our noses and gums.

The pass over which we crossed led between two abrupt snowy peaks, which, towering into the heavens, rarely uncover their hoary heads, and were truly magnificent in their white grandeur.

These mountains run, in well-defined ridges, from this point northward for some hundred miles, feeding the head-waters of the Yarlong and Kinchar rivers by innumerable mountain-torrents; while to the southward they extend about one hundred miles, finally losing their height and uniformity before reaching the Siu-shan, or Snowy Mountains, on the west of Yunnan.

Sleeping for the night on the west side of Taso, we next day reached Bathang, the border town between the eastern and central kingdoms of Thibet. Bathang, unlike Lithang, is situated in a beautiful fertile valley, in a climate resembling the north of Scotland, and forms the great central trade-mart, to which resort traders from the central kingdom and Mongolia to purchase tea, which is brought from Western Sz'chuen viâ Ta-tsian-loo. The little valley of Bathang, about four miles long and two broad, is the Eden of Eastern Thibet. Here are reaped annually two crops of wheat, while the small white pea grows luxuriantly, as do also a long-

shaped, turnip-flavoured vegetable, cucumbers, Chinese cabbages, potatoes, leeks, pears, peaches, walnuts, and water-melons. Fish (from the tributary streams of the Kinchar-kiang), mutton, and fowls, are plentiful and cheap. Supplies sufficient for one day's provision for four men are easily obtainable for a skein of silk-thread, a handful of tea, or a dozen needles.

It can readily be imagined what a paradise this little spot was to us poor travellers and our jaded animals, and the latter were soon standing up to their knees in fresh-cut green wheat.

I was informed that from Bathang I could reach the town of Rooemah, about 150 miles distant, in the district of Zyul (lying immediately on the borders of Assam), in eighteen days. Surprised at my good luck in being about to terminate a journey which had already occupied five months, I prepared for a start; but, on the very eve of departure, the Chinese officials informed me that I could not proceed by this route, as I should, in pursuing it, have to enter the central kingdom before reaching "Adzara," such being the name given to Assam by the Thibetans.

Two days more passed at Bathang—during which I used every persuasion and inducement to be allowed to go on—were spent in vain; and at last, completely foiled, I was obliged to content myself with a passport authorising me to travel towards Burmah viâ Talifoo, the Mahommedan capital of Yunnan. I thus found myself defeated in my grand object by the combination of jealousy on the part of the Chinese, who dread the loss of their monopoly in the tea-trade with Thibet, and the fears of the Lama priesthood, who foresee in the advent of foreigners to the Sacred Kingdom the destruction of their religion, which at present keeps the inhabitants in a state of ignorance and superstition, and reduces them to live in utter misery and bondage to the priesthood.

Leaving Bathang, I crossed the Kinchar-kiang, and for four days traversed a wild mountainous country. At the end of this time I reached Parmootan village, situated at the foot of the range of mountains which form the boundaries of Central Thibet. Next morning, on attempting to ascend the mountains, for the purpose of ascertaining whether I should really be stopped or not, we fell in with a body of some three hundred soldiers, who were stationed there to arrest me if I attempted to proceed. Dismounting close to where the main body were drawn up, I lighted my pipe, and entered into conversation with them. They were greatly astonished at what they termed the Palin's audacity in approaching them; but, soon understanding that I was not intent on forcing a passage, a number of them dismounted, and extinguishing the matches of

their gingalls, which they had lighted on my approach, seated themselves beside me, the rest standing at a respectful distance. I told them they were foolish to stop me, as I was only a merchant, and asked them why so many men had been sent to arrest one individual. They evinced great curiosity, marked with fear, about my revolver and rifle, which they had heard described as wonderful death-dealing engines, and asked me to fire my revolver; on doing so, they testified their astonishment at each discharge by shouts of "Al-lay!"—a favourite Thibetan exclamation of surprise. They laughed, and expressed unfeigned pleasure that I had determined to go to Yunnan, as their orders were to stop me at the risk of their lives; and they had fancied, from the description of my weapons brought to them by spies from Bathang, that I would have killed a great number of them before I could be stopped, especially as their orders further forbade them to hurt me.

After a short time spent in joking with them I remounted, and, riding off towards the south, struck the left bank of the Lantsan River.

Following the river, we traversed a still wild country, at times descending into long fertile valleys, green with wheat-crops, and on the eighth day reached Atenze, a little Chinese military station, on the borders of Yunnan. This town is famous for its trade in bleached lambskins and hams; the inhabitants are principally half-breeds; there are also a great number of Lamas living on the industry of the people.

Continuing on from this place for three days, our road led us along the precipitous banks of the Lantsan River, occasionally running close to the water's edge, then ascending 1200 or 1400 feet. It wound along the face of the bare slaty mountains, which rose in some places at an angle of 75° or 80°, the river below us looking like a tiny mountain-stream, although it was generally from 150 to 200 yards in width. On leaving the wild country at the end of the third day, we arrived at the Ludzu country, which extends westward beyond the Noukiang, and is inhabited by a tribe of that name, and put up for the night with a Christianised Ludzu family, who received us with great kindness and hospitality, evidently taking me for one of their spiritual Fathers. Their village consisted of a dozen log-houses. The Ludzu tribe are most barbarous in their habits and mode of life. In saying this, I must be understood to except the Christian converts, who have adopted the ordinary Chinese costume, and whose pursuits are those of industrious and peaceable cultivators; but the rest of the tribe are a terror to their neighbours, against whom they carry on a continual

warfare. I was informed that they raise no crops, but depend for their subsistence on the chase. Armed with crossbows and poisoned arrows, they are bold and successful hunters of deer, mhitton, or wild cattle of the same species as are found in Assam, wild boars, wild goats and bears, and also leopards. In religion they are utter heathens, sacrificing fowls to propitiate the evil spirit. In appearance they are darker than any other of the tribes I visited, and wear their hair long. Their costume, if it may be so called, consists of a girdle of cotton cloth or skins—at least, the warriors of the tribe whom I saw passing through Weisee, on their way to fight in Yunnan, had no other garments, except a few of the leaders, who wore cloaks of leopard, goat, or fox skins hanging from their shoulders. Their arms, like those of the other tribes, consisted of knives brought from the Khamti country, on the borders of Assam, spears, and crossbows. They owe no allegiance and pay no tribute to the Chinese authorities, but occasionally serve as voluntary allies for the sake of plunder, and I was informed they could muster about 1200 fighting men.

Crossing the Lantsan here by means of a bamboo-rope stretched from bank to bank, I paid a visit to two French missionaries who live at the little mission-station of Tz-coo, on the right bank, about 80 miles east of Manchee, visited by Captain Wilcox, and was received by them with great kindness and hospitality. These brave men are engaged in converting the Ludzus, and have many converts among them, often visiting the sick beyond the Noukiang. Having rested a day with the Fathers, I recrossed the Lantsan and continued my journey through a country inhabited by the numerous tribes of Yatezus, Mooquors, Mosos, and Loisus: the chiefs were exceedingly kind, and with one or two of them I remained several days. These tribes live in small villages, each under its own head-man, the whole tribe being ruled by one chief, who holds the Chinese rank of Blue-button, and is a tributary of the Chinese Government, having authority in all cases except those involving life and death, which are referred to the nearest Chinese mandarin. The whole of these tribes, in the order in which I have mentioned them, inhabit a strip of country lying between the Kinchar Kiang and Lantsan River: they are peaceable and industrious, cultivating peas, tobacco, opium, and scanty crops of cotton; they also collect gold, both by washing the sands of the Lantsan Kiang and by mining in the hill-sides. Each tribe pays a tithe to its chief, who in turn pays two-thirds of his share as tribute to the Chinese Government. In appearance and costume they closely resemble the Chinese, shaving their heads and wearing tails. The men invariably wear the blue cotton jacket and

short trousers, common in China. The costume of the women is fantastic but graceful: it consists of a head-dress of red cloth, closely braided with cowrie-shells, for which the Moso women occasionally substitute a very becoming little cap or hood of red and black cloth, with pendent tassel, a short loose jacket with long wide sleeves, and buttoned up the front, and a kilt-like petticoat of home-made cotton stuff, reaching from the waist to the knee, and made in longitudinal plaits or gathers—the ladies will pardon me if I do not use the correct expression. Instead of stockings their legs are swathed from the ancle to the knee with white or blue cotton cloth, while leather shoes, turned up in a sharp point at the toe, complete the toilet of these mountain beauties, who, though not quite so fair as Chinese ladies, are generally well proportioned and fine looking, and unembarrassed by the reserve of the fair Celestials. As ornaments they wear huge silver ear-rings, resembling in shape the handle of a common key, silver rings and bracelets, and bead necklaces. Amongst these tribes are found both the Buddhist religion and Chinese worship of ancestors, some families professing one and some the other.

Continuing on my journey I reached the Imperial Chinese city of Weiseefoo. Here I rested three days, and having procured passports from the General Commanding, authorising me to pass on my way to Talifoo, I left, and travelled through a country which had gradually become more open; our road leading us at times over long stretches of table-land, growing rice, potatoes, peas, wheat, barley, tobacco, opium (to the use of which the people are greatly addicted), and sugar, and in three days was fairly into the Tze-fan country.

The Tze-fan tribe inhabiting it closely resemble the Chinese in feature, dress, and mode of life. Although industrious cultivators, they bear an evil renown as treacherous and warlike banditti; and that they deserve it I had ample proof, having been attacked twice in the first three days of my journey through their country. They have amassed riches by the impartial plunder of Imperialists and Mahommedans; but as they have latterly imbibed a wholesome dread of the Mahomedan Government, they rarely attack travellers under its protection and confine themselves to forays in the Imperial territory, except when the advance of a large Chinese army compels them to join the strongest party for the time being to save themselves from being plundered. In the evening of the third day we reached the residence of the chief, who received us hospitably. His house was richly furnished from loot, taken in the sack of Likiangfoo Hochin (or Hoking, as it is called in the maps) and Weisee, these cities having repeatedly changed hands during the fourteen years' border warfare. I was much disappointed to find that he was

gathering his forces together for the purpose of joining the advancing Chinese army in a raid upon the Mahomedans, of whom he had been (until a day or two previous to my arrival) a staunch ally. I had counted on obtaining from him the passport necessary to enable me to enter the Mahomedan country, and although I had come thus far without it I could go no further. He persisted, however, in refusing to allow me to proceed, fearing the responsibility of our death in his country, and urged me to return to Weisee and abide the result of the forthcoming struggle. This chief is renowned amongst the border tribes both for his daring in the field and for his consummate political cunning: the latter is evident from the fact of his having repeatedly changed sides and still maintaining his position. The chief's persistence in refusing to allow me to proceed, added to the unsettled state of the country, rendered our retreat on Weisee absolutely necessary, and we left him, with many signs of good-will on his part, and retraced our steps to Weisee, where I and my Chinese interpreter were, shortly after our arrival, imprisoned by the civil mandarin, who, after a vain attempt to rob me of the little money I had, determined to put us to death. Owing, however, to the friendly interference of the Mooquor, Leisu and Moso chiefs, we were eventually released and allowed to return to Szchuan, after being imprisoned for five weeks; and thus, after eight months of painful anxiety and privation, I was compelled to retrace my steps to Shanghai.

Concluding here this slight sketch of my travels, I will add, in a few words, the results of some rough observations on the physical character of the country traversed, and especially as affecting the possibility of a trade-route between India and China. More scientific and learned men than myself have gone astray in speculations on the course of the three great rivers—Kinchar, Lantsan, and Ludzu, or Noukiang—from their sources in Thibet. I will simply observe that the courses of these rivers are laid down in the Chinese Topographical Surveys, made by order of the Emperor Chung III., comprising the country of Thibet and province of Yunnan, from which surveys the Jesuit maps have been compiled, and that they are therein represented as being the upper waters of the Yang-tsze, Cambodia, and Salween respectively. I am not aware that any doubt has ever been thrown on the identity of the Yang-tsze with the Kinchar Kiang. With regard to the Lantsan, having followed its course from Bathang into Yunnan, I found that it agreed with that assigned to it by the Chinese surveyors; I am, therefore, inclined to believe that their representation of the identity of the Lantsan with the Cambodia River is correct. As to the Noukiang, not having traced

its course, I am obliged to leave it at the mercy of the theorists; but I trust that the geographical importance attached to this part of the world will, before long, lead explorers to remove, by actual observation, all doubts on the subject—for in no other way can we decide the question whether these three rivers do or do not break from Thibet within a few miles of each other, and flowing in courses parallel and at some points scarcely 10 miles apart for nearly 200 miles south, form the upper waters of the Yang-tsze, Cambodia, and Salween rivers.

From the Jeddo range of mountains, near Ta-tsian-loo, up to the banks of the Lantsan River, I crossed range after range of mountains, all running from the north-east to south-west, and the great snowy ranges lying on each bank of the Lantsan and Noukiang rivers are a continuation of the great ranges, which, rising to the north of the Thibetan town of Tsiamdo, must form at their conjunction with the Himalayas what I believe to be the chief barrier to direct communication between Bathang and Lássa.

I am influenced in believing that this conjunction of the two ranges does occur, by the fact that the great high road from Sz'chuen to Lássa, after following a course about 40 miles due west from Bathang, turns sharp to the north on encountering the first ranges on the left bank of the Lantsan, and running parallel with them almost due north for about 200 miles, crosses a pass in them of enormous height, near Tsiamdo, then turns again and follows a south-west course to Lássa, thus describing two sides of a triangle, near the base of which some great physical difficulty must occur, otherwise it is natural to suppose the road would follow its course a little north of west direct from Bathang.

The existence of the great convolution of the Himalayas with the Patkoi Range, near the north-east frontiers of Assam, has been put forward as a reason for the impracticability of the route from Assam to China; but in following up the upper waters of the Brahmaputra to the very borders of Thibet, during my late pioneering journey in the north-east from Assam, I did not observe nor could I hear of any such convolution of mountains; whereas from Rooemah, only four days from the point I reached on the left bank of the Brahmaputra, couriers leave daily for Lássa and Pekin, striking the high road four days' journey west of Bathang, a little beyond where it turns to run north.

Taking the existence of a route between Assam and China, as proved, I have arrived at the conclusion that the Himalayas (if they do meet the great ranges running north and south in Eastern Thibet), must do so somewhere to the north of the line of route between

Assam and Bathang, and that the convolution of these mountains does not in any way interfere with communication between India and China.

31st *May*, 1870.

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2. *The Irawady and its Sources.* By Dr. J. ANDERSON.

[EXTRACTS.]

I AM no disciple of the theory that the Sanpo is the Irawady, and, in view of Turner's account of the Sanpo and the accurate observations made by Captain Montgomery's pundits, I cannot see how it is possible, at the present day, that any one could be found prepared to re-advocate its claims. It appears to me, however, that Klaproth's hypothesis has done good service to the Irawady, in so far as it excited an interest in the discovery of its sources, and gave it that importance, to which it is entitled by the enormous body of water which it carries to the sea. The very circumstance that so many able geographers have been found willing to pin their faith to the theory in question seems to indicate that there must be some foundation for the opinion that the main stream has its source a long way to the north of the Khamti Mountains. This, however, only by the way, for such evidence is of little practical value.

Wilcox gained his first view of the supposed main stream of the Irawady from the hills which separate the Namlang, one of the affluents of the eastern branch of the Brahmaputra, from the plains of the Upper Irawady. The stream winds in a large plain, spotted with light green patches of cultivation and low grass jungle. On reaching its banks he states that he and Lieutenant Burlton were surprised to find but a small river, smaller even than they anticipated, *though aware of the proximity of its sources.* It was not more than 80 yards broad, and still fordable, though considerably swollen by the melting snows; the bed was of rounded stones, and, both above and below where they stood, they could see numerous shallow rapids, similar to those on the Dihing.

As to the general question of the origin of the Irawady, he proceeds to say he felt perfectly satisfied, *from the moment he made inquiries at Sudiya*, that Klaproth's theory that the waters of the Sanpo find an outlet through the channel of the Irawady was untenable; and now that he stood on the edge of the clear stream, which he concluded to be the source of the great river, he could not help exulting at the successful termination of his toils and fatigues.

On the east and west of where they stood, about lat. 27° 26', were peaks heaped on one another in the utmost irregularity of height

and form, and at all distances. Their guide pointed out the direc- of the two larger branches uniting to form the eastern branch of the Irawady.

The elevation above the sea was found to be 1855 feet, and, on the theory that Bhamo was 500 feet above the sea, which would be equivalent to a fall of the river of 8 inches each mile, there would remain 1300 feet of fall in the 350 miles between their position and Bhamo, which he believed sufficiently accounted for the greater part of that distance being *unnavigable, excepting for small canoes.*

This eastern branch, which no European eye has ever seen and about which Wilcox professed he was unable to obtain any positive information, he calls the Suhmai Kha, Pougmai or Linmai Kha. It was described to him as rising in the northern mountains at no great distance eastwards from the *heads of the Irawady*, and the objections to assigning it a very distant course are:—first, its want of magnitude; second, the direction of the high range, which would require it to break through the most elevated ground in that quarter; and lastly, the want of room, from the presence to the east of it of the Salween.

These are all the facts which Wilcox, from his own observation and research, brought to bear on the question of the sources of this river. He may have contributed to disprove M. Klaproth's theory, but he certainly did not discover the sources of the Irawady, as he seems to have thought.

We will now examine the estimate he had formed of the river whose sources he was thus locating, but whose main stream had never been seen by him; and, in connection with this subject, he asks himself the pertinent question—"What is the magnitude of the Irawady compared with other rivers close at hand?" I shall give his own answer in nearly his own words; and with it before us we shall be able to judge whether his knowledge was sufficiently accurate to give this opinion on its probable source much weight.

He reproduces Buchanan Hamilton's statement that during the dry months of January, February, March and April, the waters of the Irawady subside into a stream that is barely navigable; and, founding his deductions as to the magnitude of the river on this description, which is certainly apt to mislead one who had never visited the main stream, it is not to be wondered that he limited its source to the southern face of the mountains bounding the Khamti plain to the north, in lat. 28°.

We shall now turn to the accounts of Hannay, Bayfield, and Griffith, to give some idea of the true character of the Irawady about 60 miles below where it receives the branch Wilcox visited.

Colonel Hannay describes the Irawady, in lat. 24° 56′ 53″ at the mouth of the Mogoung stream as still a fine river, flowing in a reach from the eastward half a mile broad at the rate of two miles an hour, and with a depth varying from three fathoms in the centre to two at the edge; and that it is not unnavigable to large boats is evidenced by the fact stated incidentally by Hannay that at the town of Tsenbo, 10 miles below the mouth of the Mogoung River, they had to change their boats for others of a smaller description better adapted for the navigation of a small tortuous stream like that of Mogoung. Even these, however, were not very small; for Colonel Hannay's required twenty-five men to paddle it.

In speaking of the first defile below Tsenbo through which they had taken their large boats, he describes it as the most dangerous part of the Irawady,—which I can fully verify from personal observation.

This portion of the river commences a few miles above Bhamo, and stretches to within seven or eight miles of Tsenbo. Between these two points it flows under high wooded banks formed by two parallel ranges. At the lower approach to the defile the channel is as much as 1000 yards broad; but as we proceed up it gradually narrows to 500, 200, 100, and even to 50 yards, according as the two ranges approach each other, again increasing in breadth as they recede, till at last below Tsenbo it spreads out again into a noble river.

Griffith's own account of the Irawady above Bhamo is, that it keeps up its magnificent character, as far as he went, to the mouth of the Mogoung River, where it is 900 to 1000 yards across, and he describes the appearance of its vast sheet of water as really grand. He observes that the general characters of the Irawady are very different from the Ganges and Brahmaputra, its waters being much more confined to one bed and comparatively seldom spread out. Generally speaking, it is deep, and the stream is not violent; and he states, what experience has proved to be perfectly accurate, that it affords every facility for navigation, although in one or two places troublesome shallows are met with. In the first defile, the channel is occasionally impeded by rocks, but it is only in this part of the river that the navigation is attended with danger.

Further, in speaking of the tributaries of the Irawady between Mogoung and Ava, he remarks that they are exceedingly small, which tends to increase the astonishment with which one regards this magnificent river.

He hazards the opinion that its source will probably be found to be the Suhmai Kha, and points out the fact that the great body

of water comes from the eastward from between the Mogoung River and Bor Khamti, in which country Wilcox visited the Irawady where it was found to be of no great size. No considerable branch finds its way from the westward, neither are the hills which intervene between these points of such height as to afford large supplies of water. On the whole, he thought it probable that the Irawady is an outlet for some great river which drains an extensive tract of country; for it appeared to him that if all its waters are poured in by mountain streams, an expanse of country extensive beyond all analogy will be required for the supply of such a vast body of water.

I attach great weight to this opinion; for it was formed by Griffiths immediately after his visit to the Brahmaputra, and because he was a man of thoroughly scientific habits of thought, *très instruit, très zélé, et fort bon observateur*, as Mirbel observes.

Dr. Williams, in his book entitled 'Through Burmah to Western China,' gives it as his opinion that a river-steamer of proper construction would have no difficulty in making her way to the Tapeng and for many miles beyond.

My comment on this is that we proceeded to Bhamo in a large steamer drawing 4 feet of water, and experienced no difficulty in the navigation, although the captain and all the crew were Burmans, to whom the river above Mandalay was entirely new. This too happened in one of the months (January) in which Buchanan Hamilton stated the river to be hardly navigable by native boats.

While at Bhamo I took the opportunity to make what I can only characterise as a rush up the first defile. Our visit was necessarily a hurried one, as our leader, Major Sladen, was in daily expectation of being able to make an immediate advance; so that, if we had gone in for a thorough investigation of the river above Bhamo, we should have certainly seriously interfered with the progress of the expedition. My visit, however, sufficed to convince me that the Tapeng makes hardly any sensible difference in the general appearance of the volume of this great river.

The Irawady at the beginning of the first defile, about five miles above Bhamo, is about 1000 yards across, and its course is defined by low wooded hills which run close to its banks. About two miles farther on, the channel narrows to 500 yards, and the hills become even closer and hang more abruptly over the stream than before, and, about another mile beyond, a higher range of hills from the south-west comes in behind the former one, and both terminate on the bank as two headlands. At this point a ridge of rocks runs half across the bed, and at this season (February) they are 8 feet above

the water; but the river is so broad and deep that I find myself speculating, in my notes made on the spot, on the course a steamer would follow in passing them.

The hills still continue on both sides, but they are highest to the west; and as we proceed for 4 or 5 miles the number of rocky points running out into the stream increases; and opposite to the village of Pivaw, about 20 miles above Bhamo, on the left bank, the channel has narrowed to about 150 yards, and here the first so-called rapids occur. The bank on which the village stands is about 80 feet high, and the country inland is undulating and runs up to low ranges of hills a few miles to the north.

Leaving Pivaw, we proceeded about 8 miles farther up the defile, or Kyoukdweng, as it is called by the Burmese, still preserving the high wooded banks on either side.

After we had gone about 3 miles above this, we came to a reach in which the river flows very sluggishly between two high conical hills, which so close in upon it that one is puzzled to detect any outlet. The quiet motion of the water and its deep olive-black are suggestive of great depth. The breadth of this lake-like reach is about 250 yards and its length about 1½ mile; and, passing on, we find it abruptly closing in at its northern end, and its channel broken up by numerous rocks, which jut out boldly on either side into the stream, and in many cases approach each other so closely that the channel is reduced to 50 or 60 yards. The height of these rocks averages 30 feet; but many of them are not more than 15 to 20 feet. The current, although strong, did not interfere much with our progress.

There is a small isolated rock on the right side of the channel, capped by a pagoda, and another little promontory farther on with a similar structure. The first appears to be of great age, and its presence on this rocky island, well into the middle of the stream and not higher, I should think, than 45 feet above it, gives us some indication as to the limit of the rise of the river; for the pagoda could not withstand the power of the current. It must be borne in mind, however, that the Irawady had not reached its lowest when I visited this spot.

This rocky reach stretches about a mile in a N.N.W. direction, and terminates abruptly above in an elbow from which another reach stretches off in a E.N.E. course, with a clear channel overhung by the precipitous but grassy sides of high hills.

The body of water which flows round this corner during the rains must be very great, and its velocity and power tremendous; for all the rocks (greenstone) subjected to its influence are rounded and

shine with an almost metallic glaze, produced doubtless by the attrition of the flood.

It should be remembered that two other defiles occur on the Irawady, one immediately below Bhamo and the other about 40 miles above Mandalay; others may be said to exist below Thayetmyo, and at Prome, where the course of the river is defined by high hills. Throughout the whole of these the river is of necessity restricted to a well-defined channel, and its breadth depends entirely on the proximity or remoteness of the hills to each other; so that its breadth is no indication whatever as to the body of water which passes through these channels, though, from the mere fact that the Irawady was contracted at one place to 400 yards, Wilcox considered himself warranted to doubt the position which had been claimed for it by Buchanan Hamilton.

With these facts before us, we are prepared to examine the honour which Wilcox claimed for himself that he had discovered the sources of the Irawady.

After a careful consideration of all the statements advanced by him in his account of the Survey of Assam and the neighbouring countries, I cannot avoid thinking that he came with a biassed judgment to the investigation of the sources of the Irawady; for he states that he felt perfectly satisfied as to the origin of the river before he left Sudiya. But, from the internal evidence of his paper, it is evident that he knew nothing of the main stream, and had never seen it. We are therefore fairly entitled to submit the evidence which he adduces for restricting its sources to the Khamti Mountains, to a rigid criticism. But, to appreciate his position, it must be borne in mind that he had set himself the task to demolish M. Klaproth, and no one had better facilities and information for doing so than this able explorer and geographer, and, to my mind, he was quite successful in his task; but, in carefully reviewing his description of the question, it appears that, in his desire to establish his position, he was led unwittingly to depreciate the importance of the Irawady, and to give it a restricted distribution at utter variance with its magnitude.

The error was a likely one; for his whole acquaintance with the river was a few hours' observation of one of its streams between the 27th and 28th parallels of north latitude, to the east of Assam, and what he learned of it beyond the spot on which he stood was derived solely from Khamti Shans, who were, according to his own statement, little given to travel, and from Singphos from the eastward of Assam. He adduced no proofs, however, that the latter had ever been to the eastward of the eastern branch of the

Irawady, which they made two days' journey above the Mogoung river, and, according to his own account, the former knew nothing of the river beyond the branch on which the villages were placed. Yet, notwitstanding all this and the fact that the Singphos generally from the east of the western branch had informed him that the eastern one was the larger of the two, he adhered to the information which he had received at Sudiya that the western and smallest branch was the source of the river, and this on the authority of Khamti Shans, who knew nothing of the Irawady beyond their own river.

A glance at his description of the stream and of the weather during his visit will be sufficient to show that the only light he threw on the sources of the Irawady was to indicate that the weight of evidence pointed in the direction of the eastern branch, as the great channel from whence that splendid river derives its supply from the highlands of Thibet, between the Yang-tsze Kiang and the head-waters of the Cambodia and Salween, and the two eastern affluents of the Brahmaputra (Sanpo), the Dihong and Brahmakund.

He says he was surprised to find but a small river, smaller even than he had anticipated, though aware of the proximity of its sources—a statement which sounds like a foregone conclusion; but he goes on to describe it as 80 yards broad, but still fordable, although considerably swollen by the melting snows. That this, however, was not the only cause of the rise of the river such as he describes it, is evident from the frequent reference he makes to the very heavy rains he had experienced on the last eight days of his march, but which never occurred to him as the *vera causa* of the flood.

Now with these facts before us, that the river during the height of a flood caused by the heavy rains and the melting snows was only 80 yards broad and fordable, the inference is forced upon us that it could be little more than a mountain rivulet during the dry weather.

Such, then, was Wilcox's supposed source of a river which 150 miles farther down measured half a mile in breadth, with an average depth of from 2 to 3 fathoms, without receiving any notable stream on the way that would account for the unprecedented difference between the two points.

The conclusion, therefore, we arrive at is that the eastern branch, as described by him, was only a small affluent of the main stream which flows down from the north-east, as described by my informant, and that the sources of the river in all probability lie considerably to the north of the so-called Khamti range of mountains, and that it

thus becomes one of the Thibetan rivers; it becomes probable that some of the Thibetan rivers flowing down from the north in the direction of the Irawady may be its upper sources, while the others may be branches of the Yang-tsze Kiang, and that the Irawady drains part of that area between Lassa and Bathang which has hitherto been apportioned to the Cambodia and Salween.

D'Anville was the first to connect the Thibetan rivers with the Cambodia and Salween, a course which was forced upon him from the circumstance that he believed the Sanpo to be the Irawady. Bringing the former river in the way he did to the west of Yunan, he considered he had provided an ample supply of water to account for the volume of the latter, and he had, therefore, to look for some other outlet for the drainage of that area of Thibet between Lassa and Bathang, to the north of the supposed course of his Sanpo, and he hit upon the Salween and Cambodia as affording the means, and the unnatural and extraordinary course which he gave them has been perpetuated ever since in the maps of Klaproth, Dalrymple, and Berghaus, without a tittle of evidence in its favour. Now that it is proved, almost to a demonstration, that the Sanpo flows in its natural course to the Brahmaputra, it is to be hoped that the Irawady will not any longer be denied its due, as a river far surpassing the Salween and Cambodia in its northern distribution.

In conclusion, I may state that these remarks have been suggested by a note of Mr. Cooper's in the 'Proceedings of the Royal Geographical Society' for June, 1869, in which he hazards the remarkable supposition that the Sanpo, as well as another large river to the east of it, falls into a river called the Yarlong, which he supposes may be either the Brahmaputra or the Irawady; an amount of uncertainty which affords an ample field for conjecture, but certainly throws little light on the subject.

The PRESIDENT having expressed the thanks of the Society to the authors of the papers,

Sir RUTHERFORD ALCOCK said there were two very important subjects broached in the papers; first, a question affecting commercial interests, which were largely connected with those of geography, and next, a purely scientific and geographical question. If a direct, practicable route could be discovered from one of the most populous and wealthy of the provinces of China, Sze-Chuen, to Assam and the Valley of the Ganges, immense wealth would pour in from each country to the other, and a line of commerce would be established of inestimable value to the whole commercial world. Unfortunately, it appeared that there were very high altitudes to be crossed, followed by corresponding depression of spirits. The Abbé Huc had some bitter experience of the difficulties to be overcome when he forced his way to Lassa, and the graphic account he had given of the hardships and miseries certainly produced the impression that it was very doubtful whether there could be a practicable route that could be used for the purposes of commerce. Still the problem was one of

such vast importance that it well became the Geographical Society to encourage every effort to solve it. When Mr. Cooper was about to undertake his journey he (Sir R. Alcock) endeavoured to dissuade him from setting out, because he felt perfectly certain that, in the present political state of Thibet and China, no foreigner had a chance of forcing his way through. Even if Mr. Cooper could so disguise himself as to pass for a Thibetan, and could speak both Chinese and Thibetan perfectly, he would still be unable to get through Thibet at present. The Lamas, who are more or less under the control of the Chinese Government, look with the most extreme jealousy and hostility on any attempt of the White Face to penetrate into their country. They believe that the peoplewho conquered India would also appropriate Thibet, and that the only means of safety for them, for their religion, and for their country, is to keep the foreigners out. The Chinese Government, certainly, had opened China to a great extent, but only under considerable pressure, and it was not very anxious for Europeans to find their way through Thibet. Although he thought that for the present it would be impossible to establish a practicable route, yet Mr. Cooper might obtain a great deal of valuable information by following the frontier and pushing here and there wherever he had an opportunity, so that in another generation, if not in this, the great object might be accomplished. It was possible, if the connection of the three rivers were traced, that a way might be found along one of their courses into Assam and the valley of the Ganges, and whoever discovered such a route would render more effectual service to the interests of commerce than he who discovered the sources of the Nile.

Major SLADEN said the expedition under his charge in 1868 reached the town of Bhamo, on the Irawady, but the information with regard to the sources of the river which was obtainable there was (as stated by Dr. Anderson) not worthy of record. Dr. Anderson's paper was nevertheless a valuable contribution in many respects, as it massed together a large quantity of information which would certainly assist future exploration. He felt sure that if a real attempt to discover the sources of the river were made, it must be successful. It would be an easy matter to send an expedition from Bhamo to the sources, and the expense and danger would be very little, as compared with the results which would be accomplished. During a residence of several years at Mandalay he had made some observations on the periodical inundations, an account of which he would beg leave to read to the meeting:—

"The Irawady is subject to annual periodical inundations, which have hitherto been accounted for, as having their origin in two distinct causes:—1. The melting of the snows in the Himalayas. 2. The periodical rains (or monsoons) which set in about June, and continue till October of each year. Now the peculiarity above referred to, as regards these inundations, is, so to speak, their strict periodicity; that is to say, their occurrence, or recurrence, at fixed monthly or bimonthly periods. To be more precise, the rise and fall of the river during the period of inundation can be defined, or described, or calculated upon, as occurring within certain fixed periods, which coincide in point of time, with the changes of the moon, or more particularly with the rise and fall of the sea-tides, as they occur, or are affected by the changes of the moon."

Of course it must be borne in mind that these inundations occur several hundred miles beyond the reach of all *apparent* tidal influence, otherwise their periodicity, as affected by the tides, would form no peculiarity at all.

"I am probably not far wrong in stating that the tides in the Irawady are rarely appreciable 100 miles from any of its mouths or estuaries; and yet at Mandalay we are allowed to witness the peculiarity or phenomenon of the inundations several hundred miles inland, and beyond the reach of all known tidal influences, being regulated, as regards time, extent, and duration, by

the same apparently external influences which control the tides everywhere, and more particularly on the eastern coast of the Bay of Bengal.

"My attention was first drawn to this very singular fact by the ordinary conversation of natives, who were accustomed, as a matter of course, to associate the rise and fall of the water, during the period of inundation, with the changes of the moon, or with the precise period of full moon and change, without reference to any particular season or month. For instance, they would say, during any particular period of inundation, '*Oh, the water will rise several feet higher next* full-moon;' or, '*The water is not so high this* change of the moon *as it was last*;' or 'The water is higher this *full-moon* than it was the corresponding *full-moon* of last year.' When I interrogated them as to facts, and asked, in astonishment, what the moon had to do with the inundations, or with their own calculations as to the period of inundation, they were amused at my ignorance or incredulity, and simply asked me to watch and note down facts then in course of progress and development under my own observation. The result has been, that during two years or seasons of inundation I became a close observer, and convinced myself, beyond all question or doubt, that the inundations did occur or recur, at fixed periods, which coincided, as regards time, extent, and duration, with the changes of the moon, or with the rise and fall of the sea-tides, as they are affected or controlled by the changes of the moon.

"Now, how is this anomaly (if it is one) to be accounted for? Observation proves that the moon does appear to exercise a complete controlling influence over the inundations, so as to make them correspond, as regards time and duration, with the occurrence of the sea-tides at the mouths of the Irawady. And yet the greater portion of the river affected by these inundations, or in which these inundations occur, is removed several hundred miles from all apparent tidal influences!

"I am, perhaps, at present the only European observer who has taken note of this very anomalous peculiarity in the periodical inundations of the Irawady, though instances are not wanting in which my observations have been verified by casual visitors, at Mandalay during the inundation season.

"None of these visitors ever doubted the strict periodicity of the inundations, or rather the coincidence of their recurrence at the time of full moon and change, or at intervals which tallied with the occurrence of the spring tides on the sea-coast.—But no one even ventured upon a solution of the peculiarity on scientific principles.

"The general idea seems to have been that the inundations were influenced, even as far up the river as Mandalay (that is several hundred miles beyond tidal influences), by the damming up, or jamming up of the water, at the several mouths and estuaries of the river, during the period of spring tides. But science has always interposed to falsify such a theory, by the simple fact that running water, with the power of expansion, cannot be forced up an incline so as to rise above its own level.

"Now the difference in level, between the mouth of the Irawady and Mandalay, where the inundations have for the most part been observed, is supposed to be 500 feet; and no one will believe that the river water, with the power of expansion over thousands of square miles of flat country in its lower course, can be forced up so lengthy and continuous an incline, so as just to overflow its bank, along the whole course of retrogression, and thus cause the periodical inundations which I have been trying to describe; but whose periodicity nobody has as yet been able to account for.

"Another theory put forward, by one of my Mandalay visitors, who was at a loss to account otherwise for the strange periodicity of the Irawady inundations, was that the inundations, as a whole, are so vast and extensive in themselves, as to form a small inland sea, or maritime lake, over which the

moon's influence would be felt, to an extent which would account for a periodical rise and subsidence of the water as affected by the moon's changes.

"A more intelligible way of accounting for the recurrence of the inundations, at periods which coincided with the changes of the moon, was, as put forward by another speculative theorist, that *possibly*, at such changes, the rains were more heavy than at other times, and brought an increased volume of water into the main channel of the Irawady, at the same time that the mouths of the river were simultaneously closed or jammed up, by an unusual influx of sea-water during the period of spring tides.

"But I do not pretend myself to put forward or support any of these theories by which to account for what I have described as a peculiarity in the periodical inundation of the Irawady. My object has been to state certain facts which appear to me to come within the scope and pretensions of this learned Society; and to invite inquiry and discussion on a subject which cannot be without scientific interest in its relation to the geography, descriptive and physical, of the far famed but still imperfectly explored waters of the noble Irawady.

EDWARD B. SLADEN."

Mr. SAUNDERS said, although Wilcox did not visit the eastern branch of the head-waters of the Irawady, it could scarcely be doubted that he ascertained for himself that he was upon the main river. There was nothing in his observations that contradicted the idea that the river might receive considerable accessions of water from the eastern branch, or even that the eastern branch might not take its rise to the northward of the Kamti Mountains, but it was not necessary to go far to the north in search of a sufficient source for the eastern branch, especially when the great height of the mountains was taken into account. Until further information was received, we were more warranted in accepting the opinion of Wilcox than that of Dr. Anderson. With regard to Mr. Cooper's statement that Bathang is in Eastern Thibet, it was recorded, on authority which had never before been questioned, that in the year 1775 the country to the westward of the Yalung River was invaded by a Chinese general to put down a rebellion, and that a survey was afterwards instituted, and the frontiers of Sz'chuen were advanced 200 miles to the westward, and beyond the Yang-tsze Kiang. Abbé Hue confirmed this statement, when he said that on his journey from Lassa, two days before he arrived at Bathang, he observed upon the top of a mountain, a stone monument built for the purpose of defining the boundary between Thibet and China. When he arrived at Bathang, he found that though the great monastery there was under the direction of an emissary of the Grand Lama, the civil government of the city was in Chinese hands. He believed we should be going back nearly a century if we were to follow Mr. Cooper in drawing the frontiers of Sz'chuen as they were before 1775.

Mr. COOPER believed it was correct to give the boundaries of countries as determined by the extent of the language, the manners, and the races of the country. From Ta-tsian-loo, which he termed the border town of China, he found a different race, a different language, and a different costume, and therefore he could scarcely believe that that district was a part of China. True, in Chinese maps, from the longitude of Ta-tsien-loo to the Kin-cha River was included as part of Sz'chuen, but only in the same way as Scotland was included in a map of Great Britain.

Mr. GALTON trusted that Major Sladen would communicate to the Society the precise observations he had made with regard to the inundations of the Irawady.

Major SLADEN said the observations were jotted down in his diary, and in noting down the rise and fall of the waters, he had always found that the time of inundation corresponded with that of the spring tides on the sea-coast. He should be happy to furnish these observations such as they were.

The CHAIRMAN congratulated the Society on the success of the session which was now ended, and the meeting was then adjourned to November.

Special General Meeting, July 11th, 1870.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

Seventy-five Fellows of the Society were present.

THE President opened the Meeting by briefly explaining the nature of the business for which it was convened. He said it was to obtain the sanction of the Fellows of the Society to the purchase of a large Freehold House, No. 1, Savile Row, for the accommodation of the Map-collection, Library, and offices. The Council had come to an unanimous conclusion that this purchase should be made; the house having nearly twice the amount of accommodation of the premises at present occupied by the Society, and the opportunity of acquiring a freehold in so central a position being of very rare occurrence. With some alterations, the house might be made sufficient for all their wants. It was a great advantage in the situation that it was close to the building recently erected for the University of London, in the great Theatre of which they expected, subject to the annual permission of the Senate, to hold their Meetings. The Society possessed funded property to the amount of about 20,000*l.*, and could well afford the purchase. It would be good economy to take this step, as the lease of the present house in Whitehall-place would expire in September, 1871, and it was expected the rent would then be advanced by 200*l.* or 300*l.* a year; besides which, extensive alterations would be necessary to adapt it to the increased requirements of the Society, and money thereby spent on property which, after all, was not their own. During several years past, the Council, in anticipation of the expiration of the lease of the Society's house, had made repeated applications to her Majesty's Government to grant them a house, or a site on which to build one, but without result. The last of these applications was made in the strongest manner by himself to the Prime Minister, who had expressed to him (the President) his sense of the public importance of the Society, and its intimate relations with various Government offices, but the answer he received was unfavourable. It was this failure of expectation of Government assistance which had compelled the Council to act on their own resources. Mr. James Fergusson, who had taken an active part in the business, would explain the advantages of the house to the Meeting.

MR. C. R. MARKHAM, Secretary, read the Rules appertaining to General Meetings ('Charter and Regulations,' Chap. V., Section 2).

The PRESIDENT stated that the Rules had been complied with, in so far

that the circulars convening the Meeting had been posted to all the Fellows resident in the United Kingdom more than a week before the date of the Meeting; and there were far more than the required quorum present.

MR. JAMES FERGUSSON rose to propose the Resolution concerning the purchase. He said that, having been a member of the Council for many years past, and having last year held office on the Board of Works, the subject of the future accommodation of the Society had been continually before him; and he felt, from the knowledge he had of the position of the Government, and the land they had to dispose of, that it was perfectly hopeless to expect any assistance in this matter from that quarter. They had, in fact, no site to give them, and were very unwilling to propose a grant of money with which to purchase one. The Council had, therefore, no alternative but to trust to their own resources, and look for some place to remove to on the expiration of the lease of their present house in September next year. The Building Committee of the Council were therefore instructed to take the necessary steps, and after examining every large house obtainable in a central situation in London, they came to the conclusion that the only one that could be considered suitable was this house, No. 1, Savile Row. The Council had, therefore, made a provisional arrangement with the proprietor to purchase it for 14,400*l*. This was done the week before last. Since then an architect and a builder had been employed to go over the house and sketch out a plan of necessary alterations, which had been submitted to the Council, and the result of their examination was, in the first place, that a Map-room could be arranged, about 60 feet in each direction, though not exactly square. This room would afford about double our present accommodation for maps. The first floor of the house it was intended should be devoted to the Library, together with a gallery round the Map-room 12 feet from the floor; this would give space for books about double that of the present Library. The library increases at the rate of about 1000 volumes *per annum*, and in their present house there was not room for one more year's increase. The house was singularly well situated for the Society, and its price not exorbitant. The new Map-room and other structural alterations would cost, according to the estimate of the architect, about 1600*l*., and, putting down 1000*l*. for new furniture and for removing, the total outlay would be about 17,000*l*. We should be just enabled to make the necessary alterations before our present lease expired. The interest we obtain for the 17,000*l*. it is thus proposed to expend is 550*l*., and the rent of the house—if we stay where we are—would be at least 600*l*., besides a considerable outlay for alterations; so that altogether we should save income by the proposed purchase. For these reasons, he, Mr. Fergusson, had no doubt of the expediency and advantages of the Society acquiring the freehold property. He would beg leave to move:—

"That the Council be empowered to expend the sum of 14,400*l*. in the purchase of the freehold house, No. 1, Savile Row, for the Society; and also a further sum, not exceeding 3000*l*., in building a Map-room at the rear of the building, and in adapting the house for occupation by the Society."

LORD HOUGHTON, as a Trustee of the Society, seconded the Resolution.

SIR HARRY VERNEY, M.P., spoke in favour of the Resolution. He was well acquainted with the house, which was one of the old-fashioned and strongly-built residences, as well built as any house in London. Its proximity to the magnificent Hall of the University of London, to which Sir Roderick Murchison referred, was a great advantage.

DR. E. BLOXAM asked what guarantee the Council had for the permanent use of the Hall of the University for their evening meetings, and whether they had the means of building a room for the meetings on the site about to be purchased?

The PRESIDENT replied that he had already stated the conditions on which the Society would have the use of the great Hall of the London University. These were similar to those on which we had the use of the large Hall of Burlington House, now destroyed, when we trusted to the London University and the Royal Society, who always gave the permission from year to year.

Mr. FERGUSSON stated that accommodation might be found for meetings in their own building, as the Map-room to be built at the rear of the house would be capable, with a little fitting and arrangement, of seating 300 people, which was about as large a number as attended our meetings on ordinary occasions. All that would be required was that the map-cases should be fitted with castors; with this and the purchase of chairs, that number of people could meet in the room.

Captain SHERARD OSBORN, R.N., also spoke in favour of the Resolution. He thanked the President and the Council for their care and foresight in obtaining this building just before the expiration of the lease of the old house. As a naval officer, and, like many other members of the Society, liable to be called by duty to distant parts of the world, he thought it most important that the Royal Geographical society should have a fixed place of abode, its own property, to which its numerous members might address themselves from all parts of the earth. He was glad that it had been determined to go no longer, hat in hand, to any Government, asking for a place. It was not a dignified position for a Society which occupies so large a place in public estimation.

The PRESIDENT then put the Resolution to the Meeting, and, on a show of hands, declared that it was passed unanimously.

In conclusion, he expressed the great gratification he felt at this unanimous vote of a General Meeting, because it testified—and this was, above all things, pleasing for a President to see—that the Council was in perfect harmony with the Society at large. The establishment of the Society in a freehold building of its own would give us the assurance of permanent existence, and it would give us additional encouragement to grant money for the equipment of expeditions; for the accumulation of funded property during later years had had for its chief object the purchase of a house, and this being at length accomplished their surplus funds would be entirely available for the exploration of distant parts of the earth.

A hearty vote of thanks to Mr. Charles White, the Member of Council who had conducted the negotiations preparatory to the purchase of the House, brought the proceedings to a close.

ADDITIONAL NOTICES.

(Printed by order of Council.)

I. *Notes on the Province of Tanibé, Madagascar.* By the Rev. JOHN HOLDING.

Position and Boundaries.—The island of Madagascar is divided into twenty-two provinces, of which *Tanibé* is one. The literal meaning of the word is "great land," and is thus derived:—*Tany*, land; *bé*, great. (The *y* in the

Malagash language, when in the middle of a word, changes into *h*.) Thus *Tani bé*, a great land or country. It is bounded on the north by the province of the *Antaveratras*, east by the Indian Ocean, south by the river *Hivondro*, and west by the province of Betanimena (great red land)—*Bé*, great; *tany*, land; *mena*, red.

Mountains.—The mountains of this province, which borders on the sea, are insignificant. From Hivondro to Fenoarivo the land does not begin to rise until within 2½ miles from the coast. In the neighbourhood of Tamatave the hills are more distant still—about 6 miles. Near Fenoarivo the coast land is bolder and more defined—huge rocks jutting into the sea. As we approach inland the hills rise gradually until they attain in this province the height of nearly 3000 feet above the level of the sea. Each range runs parallel to the other and longitudinally with the coast, and each is separated by a narrow and beautiful valley, through which a stream meanders to its confluence with some larger stream, and flows onward to the sea, or forms stagnant lagoons in its course, enriching the rice-fields and engendering fever. The coast land from Mananzari, in the province of Antimora, in the south, to Marmoetra, in the province of Antavaratra, north, at the extremity of the Bay of Antongil, is one huge belt of morass and lagoon, peopled with many varieties of fish, harbouring many beautiful and rare water-fowl, and abounding with crocodiles. To gain a distinct idea of the disposition of the mountain-ranges in Madagascar, we must set out from the dead and uniform level of the sea-coast, and lands stretching several miles inland, till we come to the foot of the first range of small hillocks of red sand, surmounted with bananas and other endogens; when we arrive at the summit of these, we generally find a village of some eight or ten houses. We see behind us the surf dashing on the shore, deafening with its roar; around us on every side rice-fields, manioc enclosures, and herds of cattle feeding; before us inland, at no great distance, a fresh and higher range of hills, approached by a circuitous path, rising gradually, making terraces as it were, almost imperceptible. When we reach the summit of this range we see behind us the stream we have crossed in a canoe, winding about lazily in the valley below—now swollen and wide by the heavy fall of rain, or nearly dry in the hot season. The small hills we have crossed are meagre, and do not show much above the dead level. We see before us a fresh range to climb, which is easily done, and then commences a range of mountains much drier and harder under foot, more solid in their formation; we still see the ocean. Twenty-five miles inland we cross another range, formed of harder substance still, of quartz rock, with crystal shining here and there. As we ascend we are almost blinded with the dazzling rays of the sun shining on its surface; still the Indian Ocean is seen, and still we hear its roar, though faintly now. We have no deep valley to cross before we reach the base of the next range; only a slight fall on the inland side, and we commence to climb another and loftier hill, and we are now upwards of 1800 feet above the sea-level, but apparently not more than 400 feet from the base of the mountain on which we stand; and so on until we reach the highest range in the centre of the island, where the various ranges are seen lying below on both sides and descending in terraces to the sea. The highest peak is near Ampalamasina, about 2870 feet above the level of the sea.

The *Rivers* in this province are Hivondro River, Vohidoity, Rangazavaka, Ifontsy, Hiarana, Paombé, Mahambo, and Fenoarivo. The Hivondro and Paombé are largest. None of these rivers are navigable; in the dry season their embouchures are stopped up, and the surrounding country is one mass of mud and alluvial deposit, left during the inundations in the rainy season. Frequently, when the rainy season commences, they change the place of embouchure. In the course of my travels along this coast I have found this the case. At one time I should be able to travel in places without any impedi-

ment in the shape of a river, or fancying the mouth in one place should find it some distance further from me, or nearer to me. When the rainy season commences a fearful scene is presented to our view, even after two days' heavy incessant rain—the banks carried away, trees come rushing down with the torrent, navigation by canoes rendered impossible; the surrounding country is inundated, the people only saved from being washed away by building their houses on the highest points near the river. The river will rise sometimes 20 to 30 feet, and fall in a few hours to the level of its natural bed. I noticed the River Hiarama when I was journeying up the stream in the month of March, 1866, to have fallen 25 feet, and even then the natives had to propel the canoe by means of long bamboo canes—the paddle was useless, the current was still so strong. Another obstacle to navigation, besides the bars at the mouth, is the frequency of cataracts—some very beautiful and lofty in their falls, others broad and shallow. The volume brought down by these cataracts after a storm is something tremendous. The sand in the beds of the rivers is mixed—talc, mica, felspar, and crystal. I have in my possession various specimens of alluvial deposit, which, though soft when gathered, is now brittle and hard as stone.

None of the streams are fordable; but they are much shallower beyond the cataracts, as a matter of course.

Lakes.—The lakes are merely lagoons of stagnant water, filled during the rainy season by the surplus waters from the rivers. These abound in the neighbourhood of Foulepoint and Mahambo; hence this is the district which is most addicted to fever and malaria. The rivers and lakes abound with fish of various kinds, all agreeable to the palate, and proving a luxury not only to the natives but to the white man who may sojourn there. The finest is similar in character to the salmon, and called *sampona* by the natives.

The Vegetation here is of a most varied character—there is such a diversity of soil; everything is rank and luxuriant. The dead dull landscape of the coast lands is richly relieved by the magnificence of the woody prospects stretching inland, crowning the very summits of the neighbouring hills. The coast is studded with noble palm-trees (coco-palm), backed up by forests of the filao-tree, which is erect as a poplar and as bushy as a fir, the foliage being somewhat similar in configuration. In passing through the woods and forests one cannot help being filled with admiration: trees springing up spontaneously on every side, planted by Nature's own hand, growing thickly together, impassable, and entwined and embraced by a thousand parasitical plants; splendid orchids, waving to and fro, with their white waxy flowers; the vanilla, with its sweet rich perfume; the convolvulus, with its showy flowers; the splendid ferns, suspended from the branches of the trees—the beautiful bulbs lodging in the joints of the branches and in clefts. Everywhere the eye turns it grows weary with the gorgeousness of the many-coloured scene; while scarcely a ray of the sun penetrates through the huge mass of dark foliage, the ground is illuminated at night with the fireflies flitting to and fro upon the moistened grass.

Shrubs, with variegated leaves, evergreen, and bearing crimson berries; fern-trees, hanging sombrously in the shade—the plantain rearing its head beside a stream; the traveller's-tree and other species of palms towering over all; a group of mango-trees here, refreshing the weary traveller with their fruit and shade; the *Nux vomica* or caffre orange, with its prickly branches and round orange-like fruit.

The principal trees are:—The Cycas tree, from which sago is obtained. The *Mango-Ravensara*, cinnamon tree, orange, lemon, coco-nut, coffee-plant, mangrove, jack-fruit, bread-fruit, plantains, bananas, *Voa vouga*, *Vangueria edulis*.

Of timber trees there are ebony, mahogany, intsy, Takamaka, *Vernha*,

Asima, Tasty, Tsokan, Tomcona, Endramena, filao, *ravenala*, a species of palm, pandanus, called the *bacoua* in Mauritius, the fibres of the bark of which sugar-bags are made. Ravenfotsy—the bark used for flooring houses, the leaves for roofing, the ribs for the walls, being fastened closely together by means of bamboo—Bamboo.

Of other trees and plants, there are gum copal, aquill-tree, ferns, pine-apples, cotton-plant, mulberry, melons, sweet potatoes, manioc, sarsaparilla, liquorice, capsicum, tangena, pistache, ginger, mangosteen (a species the bark of which is used as an astringent, and, when powdered and applied to an ulcer, has the effect of healing), acacia, aloes, sugar, indigo.

Animals.—There are no large animals in Madagascar, such as we find on the mainland. The only large animal indigenous to the country is the crocodile. The cattle of the island belong to the same species as the zebu or Indian ox. These animals are reared in large quantities, and exported to Mauritius and Bourbon, about 35,000 leaving Madagascar every year, three to four dollars paid as custom dues on each animal, making a total revenue of about 20,000*l.* per annum for the Malagash Government. Cows are not permitted to be exported, only bullocks.

The lemur is plentiful, called maka. There is the ruffled lemur, the ring-tailed lemur, the red lemur (rare), the black-fronted lemur, the white-handed lemur, and the black lemur (common). The *Galago*, very small, and of the same family as the lemur. There is an animal very much like the *Tarsius*, called in the island *Baba kota* (boy-father). The noise these little animals make at night is astonishing. Their cry is plaintive, and would lead a stranger to imagine it was the cry of a child in pain. Monkeys and the *Tenrec ventricula*. Wild cat, similar to the civet. Pigs, wild and tame, which feed on roots and the nux vomica.

The race inhabiting this district are called Betsimisaraka, the literal meaning of which is "much not to be divided." *Be*, great; *tsi*, not; *misaraka*, to separate or divide—thus: *much that is not to be divided*. The main characteristics of this race are:—long woolly hair, black, and sometimes hemp colour, or even reddish, beautiful large eyes, regular features, with white, well-set teeth, an expression at once sweet and good-natured, tolerably intelligent, forehead with head well set and well formed; rather narrow chin, with high cheek-bones, and moderately-sized ears. Their bodies are generally well made. The men are handy, active, and moderately energetic, but not so much so as the Hovahs. They are generally tall and strong, with large bones, and which are mostly covered with plenty of flesh in the prime of life. The women are handsome, taken as a body, very affable, and remarkably easy in manner. They are not so dark as their female neighbours of Betanimena, probably from the fact of the infusion of white blood from the intercourse of their ancestors with the English pirates who infested this district and the island of St. Mary. There is no doubt but they have the latent fire of courage within them, but their spirits seem to have been broken by their captivity to the Hovah conquerors. In their natural condition they seem to be inclined more to peace than strife, very rarely quarrel with each other, are not sulky, although somewhat treacherous, are honest, faithful, and truthful. Their natural affections are strong when called into play. Their women have little or no idea of chastity before marriage, and the man does not ask any questions as to the former life of his mistress, but, when they marry, they undoubtedly make faithful and devoted wives. It is not looked upon as criminal to be unchaste before marriage, and frequently before marriage they live the most dissolute lives. The principal towns are Tamatave, 8000 inhabitants; Foulepoint, 1500; Hivondro, 900; Fenoarivo, 800; Mahambo, 400; Mahasea, 280; Vohidoity, 300; Hontsy, 180. The total population of this province will not amount to more than 45,000 persons. Tamatave, the

chief sea-port of Madagascar, stands on a point of land at the west end of Tamatave Bay. It contains a population of 8000. The town is much better built than most of the Malagash towns, and is at present divided into streets. This was done under the supervision of Rahurolahy 15th Honour, who is the present governor. Before his time the natives were allowed to build their houses where they pleased, and just how they pleased. There is no pretension to architecture except amongst the foreigners. The Malagash have no public buildings except the battery, which is a rude, square, heavy building, at the north end of Tamatave, and at a short distance from the town itself. It is built of stone unhewn, and plastered over with mortar made from coral, which is abundant along this coast. The sides are perforated for about eight guns, three only of which are really serviceable, and now only used in firing salutes when a man-of-war of any other nation enters the bay, or on the arrival or departure of a consul or embassy, or for any important officer bearing despatches from the Queen of the Hovahs, Rasoherina.

The chief trade of Tamatave is in export and import goods. The chief exports are bullocks (about 30,000 per annum), rice, and fowls. For the Mauritius and Bourbon markets an occasional cargo of gum and india-rubber is exported, also tobacco. The imports are manufactured goods—such as cottons, iron-pots, clothing, and house-furniture; also rum, and other spirituous liquors; beer, porter, liqueurs, wines, &c. It is not unusual for traders to barter their rum for cattle. A fat bullock costs on board between 14 and 15 dollars, and is sold in Mauritius for 7*l*., or 35 dollars.

Wood is not permitted to be exported, by a recent ordinance made in the present queen's reign. Hides are exported from Tamatave. The chief employment at Tamatave is mat-making, rice-bag making, fancy boxes, cigar-cases, which employment is altogether confined to the women, who earn about sixpence a day each, which is quite adequate for their maintenance. Two-pennyworth of rice will support one person, and the rest goes for *bouillon* and betsa-betsa, a drink made from the sugar-cane, and *toaka* (rum). They need very little for clothes. The lower orders are content with a skirt or short petticoat of matting, made from rough dry grass, and a small bodilice for covering the neck, which they call an *akanin*, and which is made of coloured calico, and costs very little. The men wear a smock of the same material as the woman's skirt, or, if they are more respectable than ordinary, a cotton lamba of variegated hues. This lamba is a long flowing piece of cotton, about 2½ yards long and 2 feet broad, and is wrapped round their bodies in a manner similar to the Roman toga. The richer class among the women have a petticoat of cotton, a bodice of the same material, and the lamba over all. It is plain calico or linen on ordinary days, but, on particular days of festivity or custom, they usually have cotton lambas mixed with silk, or even silk lambas, which they sell to Europeans for 7, 8, or 10 pounds sterling.

The men are usually engaged in fetching rice, wood for building, and cattle and poultry from the country, to supply the market and shipping; others in pounding rice (cleaning it of the husk), fishing, labouring for the Europeans, or engaged in what is called the "Fanilroana," or queen's service; making improvements about the battery or the Hovah town. They are liable to be called upon at any time to perform this service, for which they receive no pay, and not even rations frequently. Even the servants of the white traders may be caught by the Hovah "police" if seen in the streets, and forced to labour; and several times I have had to cook my own food, for the cook, when engaged in marketing, has been captured, and led away to compulsory labour. It is of no use resisting: the answer is, "It is the queen's service," and all are considered slaves to the queen. If you ask a Malagash who is his master, if he is free, he will say, the queen; if a slave, he will give you the name of his immediate owner.

The country to the west of Tamatave is a dead, unbroken level, a vast plain about five miles inland, southward to Hivondra, and north to Ampangalana. The streets are even and regular, but most disagreeable to traverse, on account of the great quantity of sand all about. Each foreigner who intends to make Tamatave his home for any lengthened period, sets about building a nice comfortable house, with verandahs screening him from the scorching rays, and the fearful rains which prevail; creepers of various kinds entwine, fruit-trees are planted all around in his compound, and in time his home becomes really luxurious.

Foulepoint is a town lying to the north of Tamatave, about 37 miles distant. It is an irregularly built town, with narrow streets. The native name is Mahavelona. It is a tolerably safe port, and during the fine season, when hurricanes are rare, vessels can be moored opposite the custom-house. The anchorage is good and firm, and vessels of any tonnage can be admitted into the roadstead. There is a huge reef, extending a mile seaward, parallel to the coast, which is dry at low water. There are many fine coco-nut trees extending along the coast, and mangroves here and there. Foulepoint is almost surrounded with stagnant lagoons, stretching from the River Hiarana to the outskirts of Mahambo, a distance of 19 miles. These lagoons are well stocked with crocodiles, which are so audacious as to approach even the town itself, carrying off pigs and young calves. In fact, after a certain hour at night, the passage between the Betsimisaraka town and the Hovah village near the battery is not safe for any one to travel. When I have been entering Foulepoint from Hiarana, I have felt the poor bearers trembling beneath me, fancying every log of wood was a hideous crocodile. *Apropos* of this, I have seen crocodiles here 16 feet long, basking in the sun or rolling in the mud. When I was staying with Mr. Du Casse, a creole of Mauritius, who has a village on the banks of the Hiarana, one of the slave boys, who had gone down to the stream to procure water, was dragged by a huge crocodile into the water, drowned in the deep part of the stream, and then eaten up in the jungle. Our catechist at Tamatave, when on duty at Hivondro, saw three young women walking along the banks of the river, and a crocodile came and dragged the one nearest the stream into the water, and, after swimming across the river with her, disappeared in the jungle on the opposite bank. Mr. De Castelle told me that, when he was being paddled in a canoe on the lagoons south of Hivondro, near Andevoranala, the native who was steering the canoe was dragged out by a crocodile into the stream, first drowned, and then eaten by the voracious animal. It is not unusual, when passing up the River Hiarana, to see at least a score of these horrid brutes, basking on the banks, in the short distance of 100 yards. Their eggs are seen lying on the sand on either hand. The natives have the greatest horror of them, yet withal reverence them. The *odys*, or charms, are composed of crocodiles' teeth, intermixed with small portions of their ancestors' bones. These charms are always carried about with them; the *ompi sikidy* having sold them or prepared them, they are considered as talismans against any danger. They are generally worn about the neck, ancles, or wrists. Whenever I have asked the natives to remove these charms, they have looked upon me with the greatest horror.

The town of Foulepoint may be said to be divided into two parts, which it is. The portion occupied by the Betsimisaraka and Hovah traders is called *Mahavelona*, and the town surrounding the battery which commands the roadstead and Betsimisaraka town is called *Antanana*, or *Hovah Town*. In the first, the poor Betsimisaraka dwell and carry on their various avocations; here also the Hovah and foreign traders reside, and several Hovah officials are in command of the "police." The chief of the custom-house also resides here. The foreign traders live as near the sea-side as possible; in fact, the whole extent of land here bordering on the coast is occupied by them, except a small

portion surrounding the custom-house. The largest houses in Foulepoint are in the hands of foreigners, such as Mr. Charles Jeanette, who was formerly a schoolmaster in Bourbon, but who has been resident in Madagascar for twenty-seven years. He is a most enlightened man, and although, having fallen into the habits of the country, there is much in him which is sterling. He is in possession of about fifty slaves; formerly he had about three hundred. The men are instructed in various kinds of handicraft, such as those of a smith, net-worker, brazier, carpenter, boat-builder, &c. All the nets he has have been woven by his own slaves, the string spun by them, and the lead weights and corks moulded and attached. All his canoes have been modelled and constructed by his slaves. He makes nails for his own use, bolts, screws, and other implements of iron, such as rough knives, axes, and hammers; and, lastly, they have built a pretty little schooner, called *L'Esperance*, about 18 tons, which trades along the coast.

The Hovah traders do the retail trade. There are about 2000 bullocks exported from Foulepoint every year, and about 180 tons of rice, while in return they receive about 560 barrels of rum, or 27,000 gallons. These are carried away into the villages in the interior, and sold retail by the Hovah traders. For one barrel of rum the trader will receive two bullocks. Rice-bags and mats are also exported. The means of subsistence are similar to those of the people of Tamatave, the occupation and the trade being the same. The trade of Foulepoint is evidently declining, and that of Mahambo is increasing; the reason is the fever, and the utter impossibility of Europeans existing in this "white man's grave." The fever prevails here during the greater part of the year, and is most destructive to the life of the Europeans. Near to the English temporary church of St. Mary, in the centre of a splendid plain, is the cemetery of the foreigners. It is a fit resting-place for the dead. Rank vegetation all around; stagnant marshes, emitting their deadly miasma; a line of lofty trees, with luxuriant foliage—the mangosteen species—runs along the beach, imparting quite a park-like appearance to the place.

Mahambo is the port of the Antsianaka nation, and there is no doubt but that in time it will become an important rendezvous. There is good anchorage and deep water, and the place is much healthier than Foulepoint. At present rice is much cheaper than at any other port, but this may be owing to the fact that there is at present no competition. The town or village consists of one long narrow street, beginning at the beach and leading to the battery, which is built of red sandstone and mounted by two small guns. It is a rude structure, uncemented by mortar, and built in a circular form, with loop-holes for the sentries. The governor's house is outside the battery, and the soldiers reside in the immediate neighbourhood, in wretched leaf-huts *out of the battery*. There are three traders living here: one exports rice and bullocks, another rice and tobacco, and another (French) salt pork and beef and hides. Rum and cottons are the principal imports. There is a rivalry springing up between this place and Foulepoint, and, as I said, this port must give way to Mahambo, not only on account of health, but the population seem to be leaving Foulepoint, after the fire of 1866. Then there is every facility for reaching the interior, and this port commands the country and provinces of Antsianaka, which is rich in cattle and rice, while Betanimena is becoming impoverished. As far as the anchorage goes, Mahambo is by far the best; for, if a heavy storm comes on, the length of land jutting into the sea at Foulepoint is frequently washed away, and returns in another position and attitude. I have seen the point washed away twice in three years! The road from Foulepoint to Mahambo is much pleasanter than from Tamatave to Foulepoint; we have to pass through a splendid wood about half-way. It is very refreshing to leave the sea-side, with its heavy sand, its rolling surf, and glittering spray, to range through green meadows, and experience the

cool temperature of the woods, after the burning heat we have had along the sands. The landscape around Mahambo, too, is much prettier. The hills advance nearer to the shore, and are covered with wood; rivulets flow across the plain, first rippling down the hill-side, and at length emerging from the shadows of the woods, glide in smooth and shining streams across the fields and plain into the sea. There is a coral barrier-reef extending along the coast; this is the only place where one can safely have a sea-bathe. The sea at Tamatave and Foulepoint is swarming with sharks; but here on the soft sands, when the tide is up, one can shelter behind the inner barriers, and enjoy it to one's heart's content.

Fenoarivo.—This town is about 12 to 14 miles north of Mahambo. The road to Fenoarivo is partly along the coast, and partly through meadows and woods. When the road merged into the woods, it was tolerably romantic and pretty. The sea-coast is much more elevated than the rest of the coast from Hivondro to Mahambo, which is really one dead uniform level. It is very pretty, when dashing through the woods, to catch an occasional glimpse, every now and again, of the sea curling round immense rocks which run jutting into the sea; then at another moment winding down into a deep hollow between two rocky cliffs, with overhanging foliage drooping with every shade of flower and fruit, lovely ferns everywhere; then crossing a swift-running stream, the men, as they walk along, dashing the water about in such happy glee; next moment, emerging from the gloom of overhanging branches, bursting upon the prospect of a splendid bay, curving beautifully into the land, with many little coral islands spotted here and there; then away again into the woods, and at length Fenoarivo bursts upon our view. A long, large bay is before us, running to a sharp point of rock, on which the Hovah flagstaff stands, with its white ensign fluttering in the breeze; then widening gradually as it extends along the coast, until the beach is lost sight of in the rugged mountainous region of Point Zarre. An island stands at the south end of the bay.

The town of Fenoarivo is irregular, as are most Malagash towns. There is only one main street, which leads you to the battery and along the banks of the River Fenoarivo. There is a small custom-house near the river. The whole, or nearly the whole, trade of Fenoarivo is in the hands of Mr. De Castelle, who has large plantations of rice and coffee on the opposite bank of the river, stretching as far as the village of Soavola, where most of his labourers reside. I visited these plantations, and found them in most excellent order, exhibiting taste and thorough practical knowledge. The coffee-trees seemed very vigorous, and the soil well adapted for their culture. On the way back I visited the European cemetery: there are a few graves; it is a wild, neglected place on the borders of the sea. The beach here is composed of black sand; I supposed grains of iron and lead. Mr. De Castelle was telling me, during the walk, of the opposition he had met with from the Hovahs in his attempts at improvements. He built a jetty, to facilitate his work of embarking rice, &c., and receiving goods from the ships, which are anchored about half-a-mile from the point, as, when the tide is out, the river is blocked up by a broad sand-bar, and it is impossible to land goods on the beach, owing to the fall of the surf upon the sands. He had no sooner completed this jetty and arranged a code of signals on the same plan as Captain Marryatt's, than the Hovah officials came and demolished his jetty and cut down his flag-staff, saying the jetty was to land the French, and the flags for signalling the men-of-war as they passed.

The road to the "battery" leads through the town, and through pleasant meadows, until we arrive at a swamp which extends to the north, and ends near the hills about 5 or 6 miles distant in the interior. The road to the Hovah town leads across this swamp by means of a wooden bridge. It is not by

any means a safe mode of travelling. Every step we take we are in danger of falling headlong into the dismal miry swamp below. When I first traversed these bridges, it was at extreme peril and with much difficulty, on my hands and knees; but practice gradually enabled me to cross with a certain degree of facility. As soon as the swamp is crossed, we commence the ascent of several small hillocks, by a circuitous pathway, until we reach the Hovah town. We pass the first palisading after traversing the one main street, and reach the first battery boundary. Here we are challenged by a Hovah sentinel, who has been playing a game at *fifanga* to while away the time. I give him my name and tell him that my business is to pay my respects to the commandant. After waiting some time here, surrounded by many curious to know our business, we are at length commanded to enter. The ascent to the battery is very steep, after passing through various winding stockades of wood pointed at the extremity, we stand within the inner fence of palisading, before the Governor's house, which stands on a level, or small tableland, on the highest point of the hills, and commanding an extensive view. The whole of Fenoarivo is seen, with the bay. The mountains running parallel with and near the coast, and stretching northward to the river Mananzoro, are seen to great advantage. The house is well built and lofty, and is the first Malagash house with two stories I have seen along the coast, except the batteries of Tamatave and Foulepoint. The battery is not very imposing, as its name would denote, consisting as it does of a series of high barricades of wood. I am invited into the house, and mount the stairs. I found the Governor at a disadvantage, suffering from the ill-effects of a night's debauch. There had been a merrymaking of some kind or other in the town, and he looked very sleepy and dirty. His wife, or *rady malay*, was a Betsimisaraka, and sat on the floor beside him. This wife was in mourning for her mother—all her hair hanging dishevelled on her shoulders, and bristling about in every direction. After having spoken of my errand, and requested permission to be allowed to teach the people of Fenoarivo and Vohimasina (Hovah town), and gained it, we began a desultory conversation on various matters, which lasted about half-an-hour, when he gave me a glass of vermouth, and asked me to drink veloma (success) to Rasoherina their queen. I did so, and he drank to the health of Queen Victoria. This is always customary. Having said "Good-day" to them all, I commenced my return journey to Fenoarivo. In passing through Vohimasina I found that three-fourths of the houses had been burnt down on the previous night. There had been, as I have stated, some merrymaking, and the people seem to have partaken too freely of *betsa betsa*, and during the time of revelry the houses had caught fire, and nearly all were swept away by the devouring element. I should suppose the sight from Fenoarivo was grand, the hill on which Vohimasina stands being encircled with a crown of flames for upwards of three hours.

In passing through Fenoarivo I saw the butchers' stalls, or rather the place where the butcher's meat is sold. The carcase lies on clean mats, spread out on the ground. There is only one killing-day in the week here, the demand for flesh meat being almost entirely confined to the white traders, who are frequently the only ones able to purchase it. The natives are satisfied with rice and occasionally a fowl, or such fish as are caught in the river without much exertion. At Foulepoint, they kill twice a week, at Tamatave every day. The owner of the bullock must first send the choicest piece to the Governor of the place before he can sell any to others. This is called the queen's beef, and is really a government levy.

The English Church is the only religious body having any place of worship here. It has a temporary chapel in the main street, which cost 14 dollars—a portion of which was contributed by the native Christians.

Fenoarivo is much healthier than any of the other ports in this province.

Indeed, the European trader may remain here during the entire fever season without suffering much from the effects of this dreadful scourge. The ground is not so damp, and the elevated position of Fenoarivo lifts one out from the surrounding lowlands of pestilential swamps, and, to a certain extent, from the influence of their deadly miasmas. The anchorage of Fenoarivo is good, but the bay is much exposed to the east winds, and occasional hurricanes, which visit the coast of Madagascar during the months of January, February, and March.

The next place of importance along the coast is *Hivondro*, which lies about 8 miles south of Tamatave. It derives most of its importance from historical connection. It was the dwelling-place of the old princes of the Betsimisaraka in that district. The last chief was Fish, father of Mdlle. Juliet, or, as she is called by the natives, Reniboto. This man Fish, or Fiche, was the last of the Betsimisaraka rulers, and was the only one who held out bravely against the invasion of this territory by the Hovahs under King Radama I. When Jean René, the chief of Tamatave, succumbed to the Hovah authority, and ceded his territory to the Hovah king, in presence of a crowd of witnesses of both nations, on the banks of a small stream 2½ miles south of Tamatave called Marankarezo, Fiche sought an asylum, on the apostacy of his half-brother Jean René, in the Isle of Prunes, which lies about 7 miles to the north-east of Tamatave Bay. But having returned two years afterwards, he was surprised in his intrenchment at Hivondro, and he and most of his followers were massacred on the spot. Sergeant Brady, who was sent out to Madagascar by Sir Robt. Farquhar to teach the Hovah soldiers drill, is supposed to have murdered Fiche in cold blood. Reniboto was carried to Bourbon, and educated in the Roman Catholic schools there. She maintains the liveliest animosity against the English, and persists in believing that her father perished by an Englishman's hand, and looks upon the English as the cause of all her family's misfortunes.

Hivondro is important, not only on account of its historical connexions, but on account of its position on the river Hivondro. This river is navigable for many miles inland. It is also connected with the southern lakes, and is on the road to the capital, Antananarivo. Hivondro presents a curious spectacle in the rice season. Along the banks, or mooring-places for the canoes, we see representatives from various provinces—the Betsimisaraka, Betanimena, the Antimoras and Antisakas. The Antimoras and Antisakas, with their round skull-caps made of rice-straw or grass, such as we see the lower class of Mahomedans wearing, and the Antisakas from the district south of Mananary are there, looking more savage and wild than any. I have seen some two hundred canoes lying moored here at a time, each canoe containing upwards of thirty-five bags of rice, and each bag weighing 100 lbs. This rice is landed at Hivondro, and conveyed from thence to Tamatave, to supply the rice-vessels trading between this island and Mauritius and Bourbon.

The town consists of one long narrow street, running parallel with the arm of the river which comes from the north. The houses on the whole are well built—much more so, I think, than most Malagash houses. There is here a chapel belonging to the Church of England, at the north end of the village, directly facing the road leading into the town from Tamatave. The district round Hivondro is very bleak and uninteresting: sand-hills rise from the shore, and, to a certain degree, screen the town from the strong breezes which blow from the south-east in the hurricane months; but their position is manifestly unfortunate in another sense, for the very breezes which might be destructive in one way, would in another be most beneficial in blowing back the dreadful effluvia which the land-breezes bring from the jungles, swamps, and marshlands on every side the broad river. The country inland is very flat for some miles along the valley of the river until we reach *Mahanoro*, where Mr. Ferdinand

Fiche, son of Reniboto, has a sugar-plantation and rum distillery. There is here also a small body of Christians, who meet in a temporary chapel in connexion with the Church of England, but who have been interdicted from worshipping by Mr. Fiche; so when they can they go to Hivondro church—when they cannot, they worship at night in one of their houses.

Vohidoity, a village about 9 miles to the north of Tamatave, is a miserably unhealthy place on the bend of the River Vohidoity, just where it commences to wind along the coast for about half-a-mile, when it enters the sea. The village itself is a little elevated, some 30 feet above the river, while below and on the whole western sides are stagnant lagoons and fever-breeding jungle, the usual haunts of crocodiles; in fact, these amphibious animals are so numerous here, that after sundown no one dares to go near the stream, and any unlucky traveller who arrives here after sunset must perforce content himself with staying in this wretched village, sleeping in a miserable hut, and inhaling the noisome pestilential vapours.

The river is broad and deep, and well stocked with a variety of capital fish, which the natives catch in baskets and with nets.

The chief of this place is called *Betsanga*, and is a relative of Fiche, the former chief of Hivondro. He is a vicious old rogue. In the centre of the village is a pole, surmounted with bullock's horns, the souvenirs of the last festival of circumcision. When a child is circumcised, a bullock is killed and the horns are placed on the top of the post, round which the people sit when the ceremony of circumcision is being performed.

There is a bridge of rough shapeless wood across one branch of the river which leads into the road conducting to the north side of the village; and a few yards outside the town, on the road to Foulepoint, is a tomb of some former chief. There are two large stones set on end, and covered with white cotton cloth, and two poles surmounted with bullock's horns, which are *decorated* with white and red rags. Near this place I saw the *indigo* plant growing very luxuriantly in a wild state.

The next village of any importance is *Ifontsy*, which is about 14 miles to the north of Vohidoity. It stands on the east side of the island which bears the same name, and which is formed by the confluence of two unimportant streams, one coming from the south-west and the other from the south. This district derives its name from the trees, called Ravenfotsy, which grow in great numbers in the vicinity. There are no large houses, unless we except the one belonging to Raintairy, 13th Honour and Custom-house official at Tamatave, who has much land and many slaves in the neighbourhood. Mr. Joseph Condelari, an Italian living at Foulepoint, speculated in an hotel, but found it would not pay. Ifontsy is the stopping-place between Tamatave and Foulepoint. There is here a Queen's house for the use of travellers passing through, and a flag-staff at the end of the village. The white flag is hoisted when any officer of distinction passes through. On the west or left bank of the River Ifontsy, Mr. Laplace, a French carpenter, commenced boat-building; but when he had completed a very handsome chasse maré, he was not permitted to launch it by the authorities. His endeavours to obtain permission have been vain; the answer given was always, "We do not allow timber to be exported." The villag is very neat and dry, but far from being free from fever, which is generated in the neighbouring swamps and jungles. A sail round the island in a canoe is quite a treat; the variation of the foliage from the overhanging woods is quite delightful. I found some very beautiful ferns in this neighbourhood. The country between Ifontsy and Foulepoint is very beautiful until we reach the stagnant lagoons in the immediate neighbourhood of the latter place.

Ampahamasina is a village in the interior west from Tamatave. It stands upon a high mountain and is reached by passing through a most interesting

country, quite refreshing to a foreigner who has been living along the coast some time. The air is bracing, and there is no fever. It is so named from there being in the village a huge boulder, which is reverenced by the people in the neighbourhood. The hill-sides are covered with various kinds of trees and shrubs, and I noticed a great number of ferns. In one of the valleys I saw a group of splendid fern-trees. The scenery about Ampalamasina is magnificent; splendid valleys; stupendous mountain cliffs, rugged and precipitous; beautiful cascades, dashing down the mountain sides, then gurgling over rocks and winding merrily through the valleys; the varied tints of foliage—gorgeous brilliancy of flowers. On the whole it is a magnificent country. The village consists of one main street and of about thirty-two houses. The prospect from the summit is grand—huge black mountains stretching away inland, and running in one unbroken line to the district opposite Hivondro. The highest peak is about 2800 feet high. From this I was able to see Tamatave, Foulepoint, Vohidcity, and Ifontsy, and the country south of Hivondro. The sea was distant in a direct line about 32 miles. This seems to me to be a delightful sanatorium for fever-stricken white men.

Manners and Customs.—Much has been said of the moral condition of the people in the Malagash towns; but much beyond this remains to be spoken. We have said that the Malagash people are immoral, and have little or no notion of chastity. This is only too painfully the case wherever the traveller may sojourn in this remarkable island. The most painful aspect of the thing is seen in the custom of offering their women to the white traveller passing through their country. Even the most respectable, the most intelligent, do not scruple to offer their wives and daughters for the white man's use. Unhappily this custom still exists. The white traders, not over scrupulous or conscientious, avail themselves of this state of things, and we see in many towns and villages children much lighter than the rest of the people around—and these are the result of the atrocious custom of which I am speaking. It is a custom for the head of a village to do this when any stranger of any importance passes through the place; it is looked upon as a portion of the hospitality which he must extend to his guest. The women never object to conform to this odious custom, but prostitute their bodies willingly, in the hope of having offspring whiter than themselves. The large towns are a painful illustration of this, where prostitution is recognised by the authorities as a matter of gain to the Government, for every woman who lives in this capacity has to pay a certain fee or tax. She is required also to render certain important services when called upon by the officials, such as going out to meet an officer on his entrance into a town or village, or escorting him to the outskirts of the village, and sometimes to the next stopping-place on his journey. They lead the procession with singing, dancing, and clapping of hands. Their songs are generally a description, not of a man's virtues, but of his history. They detail the origin of his family, his deeds in war, and his conquests in love. When the two ambassadors arrived at Foulepoint I was present and accompanied them into the town, quite ignorant of the capacity or profession of these women. They saluted us on landing from the boat with clapping of hands and singing in a monotone something or other, which I could not then understand, but which I found, on enquiring, was a "welcome home" to the ambassadors. The female friends of the ambassadors came crouching before them, with head bent down and the right hand extended forward from the breast, with the palm open and fingers close, and, when close enough, the women threw themselves upon the ground and kissed the ambassadors' feet. The slaves advanced, also crouching, as did those of lower degree, although free; but the position of the hand with the slave was different—his hand was placed at the back of his head on the nape of the neck. It was pleasant to see these men respect the higher class of women: instead of permitting them to kiss their feet, they stooped down

gently and lifted the women up, and smiling, spoke a kind word to them. The greeting on first meeting was very interesting to one who was utterly unacquainted with their manners and customs. The true nature of female friends displayed itself: they wept for very joy to see their countrymen, who had crossed the sea to a far off land some thousands of miles away, to dwell for about thirteen months amongst palefaced strangers, now return safe and well. Many had felt that they would never see them again, and many, in whose hearts hope had long since withered and died, found the flame anew kindled, and they could not express their welcome but in sobs and tears. The cannons in the battery saluted them, the flag in the battery fluttered in the breeze, and soft music was heard in the distance; the second governor and other officials came to escort them through the town to the battery. It would be as well here to describe the band and the military array which came to lead us to the governor, who had remained behind to do the honours customary in the country. The band instruments consisted of three clarionets, three drums, and two trumpets.

The soldiers drew up in a single line, marshalled by several officers in black cloth. The private soldiers were nearly all Hovahs, and were bare-legged, their only attire being a waist-cloth or *tsidiadraka*, and a *lamba*, or flowing robe, flung negligently over the left shoulder, and then across the back and over the right shoulder, hanging down to the knees. The caps they wore seemed to have been selected indiscriminately from the receptacle of some Jew or marine-store dealer, straw hats, sailors' tarpaulin, soldiers' forage-caps, quaker's hat, and cocked hats of every rank and service. The various arms consisted of the curved swords of the officers, native make, similar to the old sailor's hanger. The private soldiers had each an old flint firelock, and a spear, which they planted in the ground in front of them when standing at ease or using the firelock. Each gun had a bayonet attached to it. A cartridge-box and powder-flask, both made of rough untanned bullock skin, were suspended across the shoulder and fastened round the waist. We were carried, as were the ambassadors, and principally by Betsimisaraka bearers, on what are termed *filanzanas*, which means in English "a thing to carry." These bearers are called *sapilanzana*, bearers-carriers to the battery. We entered beneath the long arch which opens into the interior of the battery, and saw the governor awaiting us beneath a verandah. He took no notice of us as we entered, and the soldiers at once formed in line. The commander gave the word, "Rear rank, open order, march." As at Mahambo, there was no rear rank. It seems they have learned these words and know not their signification. Each of the ambassadors put the soldiers through various evolutions! and when each had finished his command, the band struck up and played a tune. When all had put the soldiers "through their facings," &c., the band struck up "God save the Queen," the old English melody, and the governor came forward to salute us, bowing very low. His manner was affable and affectionate to the ambassadors.

It was not pleasant, although gratifying, to stand to be saluted in the blazing sun, our feet burning on the hot sand. We were invited to the governor's room, and had to pledge the two Queens of Madagascar and England in vermouth and champagne. At 9·30 P.M. we returned to the battery for supper, escorted by the soldiers bearing torches. The officers were all dressed most superbly, some in red uniforms, some in blue. We had for supper, in order:—1. Soup. 2. Rice and beef. 3. Rice with turkey and guinea-fowl. 4. One whole young sucking-pig. 5. Fish and rice. 6. Rice and curry. Many of the officers seemed unaccustomed to the use of knives and forks, and used their fingers; others used their fingers from the want of knives and forks. The way in which the pig was carved was startling. It was literally cut in two by grasping it at the back of the head with the left

hand, and smashing the back-bone with the huge sword-like carver, which was native-made. One half was handed over to the other side of the table amid much merriment. The head was severed, and choice morsels cut from the sides and handed over to the governor and visitors. One thing I remarked which was amusing, though disgusting. If the governor espied a nice morsel on the plate of his aide-de-camp, who sat next to him, he would at once snatch it from his plate and help himself with his fingers, throwing the bones, or rather emptying the bones, from his own plate on the young man's, who seemed quite used to that sort of thing, and felt honoured, no doubt, that his superior had deigned even to notice him at all, much more to deprive him of the choice things upon his plate, and indeed he seemed very much pleased to have the honour of picking the bones which his master had left.

The mode of dining in the more primitive form is much more real and enjoyable. Every one seems at ease and comfortable, because in a natural position. The rice having boiled its stated time in an earthenware or iron pot on the fire, is produced, steaming hot, and poured upon nice green leaves (ravenfontsy) spread out on nice mats upon the floor. The soup is prepared, the wild fowl or beef has been roasted and boiled, and all sit down on the floor to dinner. Each person has given him, or her, by the slaves, several slips of the same leaf, which are instantly converted into *shovels*, or rather extemporaneous spoons. The rice is shovelled up and held over the left shoulder, that a slave may pour upon it the soup or *bouillon*. This is emptied into the mouth, and each person helps himself to the fowl and beef with his fingers. When all have had sufficient, a slave goes round with a bamboo-cane and pours water into each person's hands to cleanse them. The Malagash are particularly clean in this respect. The teeth are washed and the mouth cleansed after every meal; the consequence is we rarely find a Malagash with unsound teeth or impure breath. The teeth of the Malagash people generally are white and beautiful.

The Betsimisarakas are remarkably clean in their habits. When I have been travelling about the country I have remarked how frequently they bathe. Whenever we rested at a stream these men (the bearers) had a plunge, and purified themselves from the perspiration and dust which had accumulated on the journey. I never knew them to enter into a town or village without first washing themselves in a stream and arranging their attire. The consequence naturally follows that we very rarely find leprosy and skin-disease amongst *them*. But amongst the Hovahs it is very common. The lepers in Tamatave and Foulepoint were all Hovahs.

It must be remembered the Hovahs lead a more settled and sedentary life than do the Betsimisarakas. The Hovahs along the coast very rarely work. Their chief occupations being trading and employment on the Queen's service, such as soldiers, police, or customs. Many of these men never see or touch water from year to year, except to drink.

The great curse of the people seems to be *drink*. The quantity of rum imported is enormous. Only take Foulepoint for example, and we find that every year there are 2250 gallons of rum imported every month, or 22,500 gallons per annum; while at Tamatave there are 112,700 gallons imported. The natives also prepare a native drink called *betso-betso*.

2.—*Journey from Tamatave to the French Island Colony of St. Mary, Madagascar.* By T. Wilkinson, Esq.

December 17*th*, 1866.—Early this morning I left Tamatave, with my palanquin and bearers, for the French colony of St. Mary, to the north of

Tamatave. Besides the palanquin, there was a good-sized trunk filled with clothing and provisions, and which, suspended on a pole between two men, was, together with some bedding, quite a load for them, and they could with difficulty keep up with the palanquin and bearers. Proceeding slowly, we reached the same evening the village of Ifontsy, situated about half-way between Tamatave and Foulepointe, having passed during the day a small village called Vohidoity, for a description of which, as well as the intervening country between Tamatave and Foulepointe, I refer inquirers to the works of Ellis, the missionary, upon Madagascar, which contain all the necessary information. On the 18th, at an early hour, we left Ifontsy, and reached Foulepointe, as the French call it, about mid-day. There are only about three foreign residents, traders, in this place. One of them had a small coasting lugger anchored close in-shore, with which in fine weather he traded between St. Mary and divers parts of the Malagash coast.

On the 19th we (myself and bearers) left Foulepointe early in the morning in a northerly direction, the route being more or less along the sea-beach, and in cutting off corners we sometimes passed through tracts of timbered lands. The first canoe crossing-place was called (as pronounced) "Angôbâ," but whether a river or a lagoon, I could not determine on account of the sluggish nature of the water, which appeared to have no movement one way or the other, and I was in too much of a hurry to try and examine it further up. We soon reached another crossing-place of the same kind, called (as pronounced) "Fangafaran." At each crossing-place we paid the sum of about two pence to the owner of the canoes, who assisted in paddling us over. The canoes were so small and wretched that only three or four persons could cross each trip, and the least imprudence or unsteadiness would cause the upsetting of the canoes, the loss of the baggage, and the drowning, probably, of any passengers who could not swim. About 11 A.M. we arrived at Mahambo, a rice-trading village on the coast, that had considerably increased in size during the last few years. My host here, a native of Mauritius, was engaged in trading in cotton goods with the natives, in exchange for rice, of which grain (the staple produce of Madagascar) he stated that Mahambo furnishes about 500 tons yearly. He had a quantity of rice on hand, and was waiting for a ship to send it to Mauritius. He also stated that the anchorage, open to the northward, but protected by land and a coral-reef on the other sides, could accommodate vessels of 600 or 700 tons, and that vessels of only 300 tons could come in almost close to the shore, also that several cargoes of bullocks have been shipped from this place to Mauritius this year. The place, which was formerly very small, has now a population of probably 1000 Malagash, as also two or three foreign rice-traders, who buy rice from the natives, and resell it to the Mauritius and other vessels that come in here. A battery is in course of construction by the Hovahs, and the red earth and clay of which it is composed looms bright in the rays of the sun, and can be seen at a considerable distance. After breakfast we started northward, and late in the evening reached Fenoarivo, a place of considerable importance on account of its rice-trade. Between Mahambo and Fenoarivo we had crossed a river or lake connected with the sea, named (as pronounced) "Azafo," and we also saw some large long stones, sticking upright in the ground, and wrapped up in white calico, said to be in memory of dead persons. Our path was over rocks that jutted out into, and bounded, the sea; over plains covered with fine wiry grass; through forests in which orchids were very conspicuous, and through parklike scenery that much resembles portions of Australia. During the journey from Tamatave up to this point, I noticed that where the sea-beach is sandy the trees grow at some distance from it, and there is much back-water, as though the sea had gradually retired and left some of its waters behind it; but where the beach is rocky the trees and sea meet, the sea

washing up into the roots of the trees, and instead of back-water there is, so to speak, "back-land," large rocks in isolated masses far out into the sea, around and over which the sea dashes with great force.

On approaching Fenoarivo the scenery became much more romantic, hills and red solid earth, instead of the everlasting level sands that skirt the sea-shore to the north and south of Tamatave. Fenoarivo is much larger, and has a more ancient appearance than Mahambo, and there are immense mango-trees, as at Foulepointe. Opposite the village is a small low wooded island, named (as pronounced) "Nossi Ansamo," and said to have been used as a burial-place from time immemorial for the ancient chiefs of this part of the country, some of whose descendants, scattered and few since the Hovak conquests, continue to use it at the present time.

Fenoarivo is situated in a large bay, in which there is again a smaller bay, where boats and small craft anchor. The bay proper, where large vessels anchor, is protected from wind and sea by the mainland and by the island already mentioned, and is said to be safe in ordinary weather. The anchorage ground consists of sand and mud, the latter carried down and deposited in the sea by one or both of the two rivers that run into the bay on each side of the village of Fenoarivo. There is a battery at some distance from the bay. The native population of the place is, including the garrison, probably about 2500, and there is a long street, apparently the only street in the place, about a quarter of a mile long, running nearly east and west. On account of the rain which fell on the morning of the 21st, we did not start until mid-day. Our route was principally along the sea-shore, which was fringed by such trees as "vacoas" and "filaos," as they are called in Mauritius, and other trees. About 3 P.M. we arrived at a lake several miles in circumference, called "Tampolo," between which and the sea we had barely room to pass dryshod, the sea-mouth of the lake appearing to have been recently closed by a bar of sand, like many other outlets which close and open again at intervals. About two hours before sundown we crossed, in a frail canoe, the wide mouth of the romantic-looking river called (as pronounced) "Manangoro." A fresh north-east breeze blowing at the time raised such a ripple as to cause the water to wash into the canoe, and only four persons, sitting as still as possible, could be conveyed over at one time, so that it took nearly two hours to pass over our whole party. Upon landing on the opposite side we had to ascend a steep hill to reach a group of huts where we were to pass the night, and which form one of the government stations for the relays of runners employed to forward letters and messages in cases of emergency. The view from the hill-top was magnificent. To the eastward the sea, lighted up by the rays of the setting sun, was spread out as far as the eye could reach, and high ranges of hills bounded the vision westward, while between them and the sea were other hills and forests and the wide spreading river, very wide here at its mouth and studded with islands, among which a few fishing-canoes were silently gliding. The fish seemed abundant, from the manner in which, ever and anon, they leaped from the water into the air, and there is also said to be good shooting on this river. On the 22nd we started at daylight, as usual, to escape the fiery rays of the sun as much as possible, and having crossed the (as pronounced) "Mananastra" River about 10 A.M., reached a rice-trading village named (as pronounced) "Manankatafa" about 11 A.M., where we breakfasted. The rice from the interior that is purchased here is sent on to Fenoarivo, or St. Mary, by sea in canoes, the sea being much calmer here than on many other parts of the coast on account of the island of St. Mary (Malagasi name "Nossi-bryo") acting as a sort of breakwater to the heavy sea-swell. The track, so far, along the coast had been level and easy of access, but an hour or two after leaving Manankatafa it became so difficult that I had to dismount from my palanquin and travel on foot for about 2 miles. Our path lay along

steep ascents and descents, over hills of red earth mixed with white quartz; over mountain streams in which the water was deliciously sweet and cool; over and under fallen and half-fallen trees; and over rocks, shrubs, and flowers, that obstructed the track, which, originally a mere footpath, had been so worn year after year by the hill-torrents that it has now become in places a deep gully, or furrow, several feet high on each side, though only wide enough for one man to walk in, and the forest was so thick and tangled in some places as to cover the top of the gully, thus forming a sort of tunnel, the whole scene reminding me of the difficult road between the coast and the capital. From the top of one of the steepest ascents there was a fine view, decidedly the best on this part of the coast, of St. Mary, with its white-looking buildings and fortifications distinctly visible at a distance of many miles to seaward, while to the northward and westward, bounded only by the horizon, were lofty ranges covered with thick forests. The long low sandy "Point Larre," as the French call it, or "Evonga," as it is called by the Malagash, was also visible, running away out to the eastward until it appeared almost to touch St. Mary, the sight of which in the possession of the French does not tend, probably, to produce the most amiable feeling in the breasts of the Hovahs. The path finally descended again to the coast, where, over sand and rock, we followed along the sea-shore, which was here covered with red sea-weed, until we came to some wretched-looking huts on the river called (as pronounced) "Marimbo," where we stayed for the night.

There being no empty hut, I had to sleep in the same room with a Hovah family of several persons, and a number of fowls, fleas, &c., &c.; and the large fire by which the family was cooking its rice (for these people always dine late) made the hut intensely hot and very trying to a sick person like me.

Early on the 23rd we crossed, in a canoe, the River Marimbo, and about 10 A.M. arrived at the River Tsiamanga, where were a few miserable huts, and where we breakfasted, having previously passed, about 9 A.M., the Hovah village and battery of Masovarinka, the military commander of which rules over Point Larre and the adjacent country. The battery was situated some distance off from the road, to our left, and presented the appearance of a hill crowned with huts, and, being at least half a day's journey inland from Point Larre, could not be so easily surprised by a French descent as if it were nearer the Point. After breakfast we crossed the river in a canoe, and proceeded over a low sandy country covered with woods and swamps. The heat was intense, as the lowness of the land and the trees completely shut out the sea-breeze, and we were glad, about 4 P.M., to reach Point Larre, where there are a custom-house, flagstaff, and Hovah officials. The only vegetation seemed to be a few cocoa-nut trees, and there were a quantity of native huts, in one of which lived a Frenchman (the only foreign resident in the place), together with his mistress, though he has another establishment and another mistress at the adjacent island of St. Mary, where he was visiting at the time of my arrival, and with which he carries on a trade in rice and bullocks by means of large canoes. As he was absent, however, his mistress refused to let me have a canoe, so that I could not cross over to St. Mary that day as I had intended.

The Hovah chief of the custom-house, however, was very kind, and placed at my disposal a large, well made, airy hut, furnished with chairs and tables. Point Larre, or Evonga, seems capable of furnishing rice and bullocks to shipping, though ships seldom call here, notwithstanding that there is a tolerable anchorage to leeward of the Point, the long island of St. Mary abreast, forming a sort of natural breakwater. One day's journey up the coast is the bay, called Tintingue by the French, and Mahela by the Malagash, which, though a secure anchorage, is seldom visited by shipping, there being no Hovah governor nor custom-house there. Point Larre seems an open sandy point, with nothing but a few miserable trees to protect it from the summer

sun and the bleak wind of winter. There are about 100 huts, and, allowing two persons on an average to each hut, this would give a population of 200 persons. Between here and Tamatave the traveller can procure fish, fowls, rice, and eggs at most of the stations, and that is all there is; scarcely a drop of milk could I get in a country where cattle swarm, and butter or cheese are, of course, things not known. Population is sparse, and there is no cultivation to speak of, except rice, the production of which all over this part of the island would probably be much increased did proper means of transport to bring it to the shipping depôts on the coast exist; but under the present uncivilised system nothing will ever exist, except perhaps missionaries, who are at the capital in fifties, and seem to flourish. The poor population of this portion of the coast lives upon rice, fish, bananas, sugar-cane, and such other easily obtained food as the place affords; while the wages—about six shillings per month—that some of them receive from foreign traders, together with the trade that they drive with, and the custom dues that they receive from foreigners, also help them to make a living. The traveller should come well provided with "cut money" (French five-franc pieces chopped up into little bits), the change of the country; for, whereas near Tamatave it is so plentiful that he receives the value of 10¼ cents in exchange for a five-franc piece, here he only obtains 96 cents, and very often no change at all can be procured. On the 24th I fell in with an old Malagash native of St. Mary, and consequently a French subject, who was going to cross over to St. Mary on the morrow, with some bags of rice, and he promised to give me a passage in his canoe on the top of the rice-bags. Communication with St. Mary seemed (probably from political motives) to be discouraged as much as possible.

After about three hours' passage, we landed at a small wooded inlet, where was a hut inhabited by a Franco-Malagash policeman, and where we landed some baggage; after which, coasting along the island to the southward, hills, roads, and trees were often visible, with here and there a hut and a patch of reddish black, where the red soil had been denuded by fire of its native verdure preliminary to planting it with rice; and after two hours of this kind of coasting, sometimes under sail, and at other times propelled by our oars, we reached, about 11 A.M., a snug little wooded cove, called (as pronounced) "Ambatakokon," where the owner of the canoe resided, and after the rice had been landed, the canoe was hauled up on to the beach, and the party had some boiled rice, fish, &c., &c., as refreshment. I then hired a small canoe for the sum of 10f., and after a trip of three hours more in a southerly direction along the coast, nearly upsetting once or twice, the country gradually assumed a more level appearance. The cocoa-nut trees were more and more numerous, the white buildings of the French seat of government, called (as pronounced) "Ambodifatre," began to appear as we finally landed. It was Christmas Day, and several French flags were flying; there were quite a number of well-built stone houses, some fortifications, a floating bridge, and a good road,—a wonderful thing in Madagascar. It appears altogether to be the best built place on this coast at least, and perhaps with the exception of a portion of the capital, the best built place in Madagascar. A black Malagash policeman, in French employ and uniform, met me at landing, and asked me if I came from the "Grande terre," meaning the Madagascar mainland, he also asked me my name, and I gave him my card to carry off to his superior in command. The place where I landed was called "Isle Madam," a very small island connected by a temporary floating bridge with the main island, and on it are constructed nearly all the Government establishments, such as Government House, Government stores, barracks, the Military Hospital, &c., &c. The island of St. Mary is about 50 kilometres long, by 10 wide, and is situated at the distance of about 8 miles from the nearest point of the Malagash coast. The reefs on the east coast of the island make it inaccessible to

shipping on that side, but on the west side a gap in the belt of reefs enables vessels of large tonnage to penetrate into a bay formed by the embouchures of two small rivers, and it was close to this spot, the residence of the few French inhabitants of the island, that I had landed. The anchorage, say the French, is deep, 8 or 10 metres, and the waters are always calm.

3.—*On the Specific Gravity of the Water of the South Atlantic.** By Samuel White Hodding.

The chief differences in oceanic specific gravity arise from rainfall and evaporation. The increase or diminution of change caused by the latter is quite apparent from daily observation, but when a region of ten degrees square is taken to mean observations, and the results found carried on to the adjacent regions similarly treated, the effect of the relative degree of evaporation is marked and interesting. For some years past I have made a practice of taking observations of the dry- and damp-bulb thermometers every two hours throughout the twenty-four. These have been registered in the same latitudes on three following voyages at the same season of the year, and when duly meaned enable me to point out their value in showing the relative degree of moisture prevailing over the regions traversed on our homeward route. The comparison of the differences between the two thermometers with the change in specific gravity is especially worthy of note, and may be clearly traced in the following table, in which observations are entered which are taken in the parallels between 35 s. and 30 n.

Atlantic Ocean.	Specific Gravity.	Difference of Dry and Wet Bulbs.
Between 35° S and 30° S	·02579	3°·6
,, 30 ,, 20	·02638	4°·3
,, 20 ,, 10	·02717	5°·0
,, 10 ,, 0	·02686	4°·6
,, 0 ,, 10 N	·02623	3°·5
,, 10 ,, 20	·02655	3°·7
,, 20 ,, 30	·02754	4°·4

By this table it is shown that—

An increase of 0°·9 between the thermometer gives an increase of ·00059
,, 0·5 ,, ,, ,, ·00079
A decrease of 0·4 ,, ,, a decrease of ·00031
,, 1·1 ,, ,, ,, ·00063
An increase of 0·2 ,, ,, an increase of ·00032
,, 0·7 ,, ,, ,, ·00099

From these figures it appears that an *increase* in the amount of evaporation has more effect in *increasing* the range of specific gravity than a decrease has in diminishing it; showing, it would seem, a tendency of sea-water to establish its equilibrium more easily when disturbed by rainfall than when rendered heavier by an increase of evaporation. From the six observations in the last table, the four cases of increase against the two of decrease give the following result:—

An increase of 0·575° causes an increase in specific gravity of ·000672,

but

A decrease of 0·75° only causes a decrease in specific gravity of ·000470.

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* Extracted from a Memoir communicated to the Society by the author, 'On the Currents and Specific Gravity of the South Atlantic.'

One cause, therefore, appears to have double the effect of the other; according to this, the change for the even degree would be—

Change of 1° + would give change in specific gravity + ·001253
" 1° − " " " − ·000626.

I believe that a large number of observations extending over several years would enable one to establish a proportionate ratio of change in specific gravity depending on the degree of evaporation. The suggestion I brought forward just now, on the apparent tendency of sea-water to regain its equilibrium more easily under one cause of disturbance than another, is one that cannot be satisfactorily proved by the comparatively limited number of the observations.

There are other causes which alter the range of specific gravity besides the effects of rainfall and evaporation; there is an illustration of this in the great Southern Ocean. I allude to the melting icebergs, which, breaking adrift from the Antarctic continent, are borne northward till they arrive in temperate regions, where they soon become part of the ocean they hitherto floated in. There are two great ocean currents in the southern hemisphere, well known to seamen under the names of the Mozambique and the Antarctic, or icebearing, currents. The meeting of these two currents being often very abrupt, a large amount of latent heat is set free on the condensation of vapour near the limits of the tropical current, giving rise to storms and other meteorological phenomena so frequently experienced by seamen in rounding the Cape. The specific gravity of the Antarctic current is, as might be expected, lower than that of the Mozambique. Observations on three winter voyages prove this fact; the results are:—

	West of Cape Agulhas.			East of Cape Agulhas.	
	Spec. Grav.	Temperature.		Spec. Grav.	Temperature.
1st Voyage ..	·02544	62·0	.. ..	·02578	59·7
2nd " ..	·02523	58·7	.. ..	·02557	57·3
3rd " ..	·02669	59·3	.. ..	·02725	57·8

These observations are taken between 30° s. and 35° s., and show that on each voyage the specific gravity falls on entering the cold waters of the Polar current.

Here is the mean of the three voyages:—

West of Agulhas.			East of Agulhas.	
·02579	60·0	.. ..	·02620	58·3

The difference is certainly small (·00041), rather less than half a degree on the scale of the hydrometer, but yet the same difference exist on each voyage, one confirming the other. Perhaps the small difference may arise from taking my observations too near the limits of either current, but ships homeward bound do not, as a rule, remain long in these latitudes, hence so limited a number of observations.

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1864		Barnett, H. C., Esq. *Care of Alex. Whytock, Esq., 9, George-street, Edinburgh.*
1867		*Barns, John W., Esq. *Rhamulpore, Punjaub, India; and Higher Town, Buckfastleigh, Devon.*
1858		Barratt, James, Esq. *Lymm-hall, near Harrington, Cheshire.*
1859		Barrington, Lord, M.P. *19, Hertford-street, Mayfair, W.*
1867		Barrington Ward, Marcus J., Esq., B.A., F.L.S., &c. *Clifton-cottage, Bristol; and 14, Alfred-street, Belfast.*
1833		Barrow, John, Esq., F.R.S., F.S.A. *17, Hanover-terrace, Regent's-park, N.W.*
1863	110	Barry, Alfred, Esq.
1857		Bartholomew, John, Esq. *17, Brown-square, Edinburgh.*
1861		Bartlett, Herbert Lewis, Esq. *Union Club, S.W.*
1862		Barton, Alfred, Esq., M.D. *Hampton Court.*
1864		Basevi, Capt. J. P., R.E. *100, Belgrave-road, S.W.; Messrs. Grindlay & Co., Parliament-street, S.W.*
1837		*Bateman, James, Esq., F.R.S., L.S. *Knypersley-hall, Staffordshire.*
1859		Bateman, John F., Esq., C.E. *16, Great George-street, Westminster, S.W.*
1866		Bates, Henry Walter, Esq., F.Z.S. *15, Whitehall-place, S.W.*
1866		Bateson, George, Esq. *Heslington-hall, York.*
1866		Batten, John H., Esq. *Alverne Hill, Penzance; and Oriental Club, Hanover-square, W.*
1864	120	Bax, Capt. Henry G. *2, Sussex-place, Hyde-park-gardens, W.*
1857		*Baxter, Sir David, Bart. *Dundee; 5, Moray-place, Edinburgh; and Kilmanny-castle, Cupar, Fife.*
1867		Baxter, Richard, Esq. (Barrister-at-Law). *19, Leinster-gardens, Bayswater, W.*
1858		Baxendale, Joseph H., Esq. *78, Brook-street, W.; and Scott's-bridge, near Richmansworth, Herts.*
1867		Bayley, Chas. Jno., Esq., C.E., M.A. *51, Victoria-road, Kensington, W.*
1863		Bayley, H. Esq. *Blackheath-park, Kent.*
1862		Bayly, Lieut.-Col. John, R.E. *Ordnance Survey Office; 131, St. George's-road, Pimlico, S.W.*
1862		Baynes, Lieut.-Col. R. Stuart. *Army and Navy Club, S.W.; and 38, Jermyn-street, S.W.*
1858		Baynton, Capt. Edward. *Trafalgar-lodge, Shirley, Southampton.*

Year of Election	
1866	Beamish, Captain H. H., R.N. *Care of Messrs. Hallett and Co., 7, St. Martin's-place, W.C.*
1832	130 Beardmore, Nathaniel, Esq., C.E. *30, Great George-street, Westminster, S.W.*
1854	Beaufort, William Morris, Esq., Bengal Civil Service. *Bengal.*
1856	Beaumont, John Ang., Esq. *Wimbledon-park-house, Wimbledon, S.W.; and 50, Regent-street, W.*
1851	*Beaumont, Wentworth B., Esq., M.P. *144, Piccadilly, W.; Bywell-hall, Newcastle-upon-Tyne; and Bretton-park, Wakefield.*
1867	Beazeley, Alexander, Esq., C.E. *Engineers' Office, Trinity-house, E.C.*
1867	*Beazeley, Michael, Esq., M.I.C.E. *Trinity Works, Penzance, Cornwall.*
1865	Bebb, Horatio, Esq. *13, Gloucester-place, W.; and Leamington.*
1861	Beckett, James F., Esq., Staff Commander R.N., F.R.S.A. *6, Boyne-terrace, Notting-hill, W. Care of Captain George.*
1838	Benkford, Francis L., Esq. *Ruxley-lodge, Esher, Surrey.*
1859	*Bedford, Rear-Admiral G. Augustus, R.N. *South-view, Widmore-road, Bromley, Kent.*
1868	140 Bedingfeld, Felix, Esq. *Reform Club, S.W.; and 41, Clarges-street, W.*
1861	*Begbie, James, Esq. *17, Trinity-square, Tower-hill, E.C.*
1860	Begbie, Thomas Stirling, Esq. *4, Mincing-house-place, E.C.*
1846	Behn, Charles Tilstone, Esq., PH. DR., F.S.A., &c. *Belmont-house, near Canterbury.*
1853	Belcher, Rev. Brymer. *St. Gabriel's, Pimlico, S.W.*
1830	*Belcher, Vice-Adm. Sir Edward, K.C.B., F.R.A.S. *22A, Connaught-square, W.*
1858	Belham, Edw., Esq. *Poynton, Herts.*
1863	Belmore, The Earl of. *Carlton Club, S.W.*
1858	*Bell, C. Davidson, Esq., Surveyor-General, Cape of Good Hope. *Cape Town. Care of the S. A. Pub. Library, Cape Town. Per Messrs. H. S. King and Co.*
1830	Bell, James Christian C., Esq. *42, Westbourne-terrace, W.; and 15, Angel-court, Throgmorton-street, E.C.*
1868	150 Bell, Wm. A., Esq. B.A., M.D., *18, Hertford-street, Mayfair, W.*
1864	Bellamy, Edward, Esq. *10, Duke-street, St. James's, S.W.*
1830	*Bennett, John Joseph, Esq., F.R.S. *British Museum, W.C.*
1857	Bennett, J. Risdon, Esq., M.D. *15, Finsbury-square, E.C.*
1856	*Benson, Robert, Esq. *16, Craven-hill-gardens, Bayswater, W.*
1856	*Benson, William, Esq., Barrister-at-Law. *16, Craven-hill-gardens, Bayswater, W.*
1830	Bentham, George, Esq., Pres. L.S. *25, Wilton-place, S.W.*
1868	Bentley, George, Esq. *Upton-park, Slough.*
1853	Bentley, Richard, Esq. *New Burlington-street, W.*
1859	Berens, H. Hulse, Esq. *Sidcross, Fort's Cray, Kent.*
1865	160 Bernard, F. N., Esq. *16, Leadenhall-street, E.C.*
1866	Berridge, F., Esq. *Winchester-house, Winchester-road, Adelaide-road, N.W.*
1856	Berry, Josiah, Esq. *19, Regent-square, W.C.*
1863	Best, William, Esq. *3, Belle-vue-place, Southampton.*
1867	Best, William John, Esq. *104, Franklin-street, New York.*

Year of Election		
1867		Bethune, Alexander M., Esq. *Otterburn, Hamlet-road, Upper Norwood;* and 122, *Leadenhall-street, E.C.*
1842		*Bethune, R.-Adm. C. R. Drinkwater, C.B. 4, *Cromwell-rd., South Kensington, W.*
1864		*Betts, E. L., Esq. *Preston-hall, Maidstone, Kent.*
1838		Betts, John, Esq. 115, *Strand, W.C.*
1868		Bevan, George Phillips, Esq. *Junior Athenæum Club;* and 4, *Suffolk-square, Cheltenham.*
1866	170	Bevan, William, Esq. 8, *Cedars-road, Clapham-common, S.*
1862		Bicker-Caarten, Peter, Esq. 30, *Northumberland-place, Bayswater, W.*
1866		Bicknell, Algernon S., Esq. 37, *Onslow-square, S.W.*
1862		Bidie, Geo., Esq., M.D., &c. Madras Establishment, Madras. *Care of Messrs. H. S. King and Co.*
1865		Bidwell, Charles Toll, Esq. *Garrick Club,* 35, *King-st., Covent Garden, W.C.;* and 28, *Grosvenor-st., Eaton-sq., S.W. Care of John Bidwell, Esq., Foreign Office.*
1860		Bidder, G. Parker, Esq., C.E. 24, *Gt. George-st., S.W.;* and *Mickham, Surrey, S.*
1859		Bigge, Frederick W., Esq. *Dobden-hall, Saffron Walden.*
1868		Bigge, C. H. Walker, Esq. 2, *Alexandra-terrace, Reading.*
1850		Bigsby, John J., Esq., M.D. 89, *Gloucester-place, Portman-square, W.*
1858		Birch, Augustus F., Esq., M.A.
1860	180	Birch, H. W., Esq. 46, *Welbeck-street, Cavendish-square, W.*
1858		Birch, John William, Esq. 9*, *New Broad-st., E.C.;* and 27, *Cavendish-sq., W.*
1859		Birch, Capt. Thomas, R.N. *United Service Club, S.W.*
1862		*Birchill, Capt. B. H. H. *Old-lodge, Hartfield, Tunbridge-wells.*
1867		*Bischoffsheim, Henri Louis, Esq. 7, *Grafton-street, New Bond-street, W.*
1858		Bishop, George, Esq., F.R.A.S. *Union Club, S.W.;* and *The Meadows, Twickenham, S.W.*
1861		Bishop, James, Esq. 11, *Portland-place, W.*
1867		Bisson, Fredk. S. de Carteret, Esq. (Lieut. R.I.M.). 70, *Berners-street, W.*
1836		*Blaauw, William H., Esq., M.A., F.S.A., F.L.S. *Beechlands, near Uckfield, Sussex.*
1860		*Black, Francis, Esq. 6, *North-bridge, Edinburgh.*
1867	190	Black, Thomas, Esq., Superintendent P. and O. Steam Navigation Company's Dockyard. *Oriental-place, Southampton.*
1869		Blacker, Louis, Esq. *Flowermead, Wimbledon-park, S.W.*
1858		Blackett, Henry, Esq. 13, *Great Marlborough-street, W.*
1849		Blackie, W. Graham, Esq., PH. DR. 36, *Frederick-street, Glasgow.*
1862		*Blackstone, Frederick Elliot, Esq., B.C.L. *British Museum, W.C.*
1854		Blaine, D. Roberton, Esq., Barrister-at-Law. 3, *Paper-buildings, Temple, E.C.* and 8, *Southwick-place, Hyde-park-square, W.*
1869		Blaine, Henry, Esq. 79, *Belsize-park-gardens, Hampstead.*
1868		Blair, William Edward, Esq. *Windham Club, S.W.*
1863		Blake, Brig.-Gen., H. W. *Moulmein, British Burmah.*
1857		*Blake, Wollaston, Esq. 8, *Devonshire-place, W.*
1868	200	Blakiston, Matthew, Esq. *Moltersley, Knutsford, Cheshire.*
1857		Blakiston, Captain Thomas, R.A. 28, *Wellington-street, Woolwich, S.E.*

Year of Election

1861 *Blakeney, William, Esq., R.N. *Hydrographic-office, S.W.*

1838 Blanc, Henry, Esq., M.D., &c. *Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.*

1830 *Blanshard, Henry, Esq., F.R.A.S.

1861 *Blanshard, Henry, Esq. 78, *Westbourne-terrace, W.; and* 53, *Chancery-lane, W.C.*

1857 Blanshard, Richard, Esq. *Fair-field, Lymington, Hants.*

1833 Blaxall, Fras. H., Esq., M.D. *Tendring, near Colchester.*

1854 Blencowe, W. Robert, Esq. *The Hoo, Lewes.*

1861 Blenkin, William, Esq. *Addlestone, Surrey.*

1830 210*Blewitt, Octavius, Esq. 4, *Adelphi-terrace, Strand, W.C.*

1864 Blore, Edward, Esq., D.C.L., F.R.S., F.S.A., &c. 4, *Manchester-square, W.*

1866 Blow, William Wootton, Esq. 22, *Wigmore-street, W.*

1861 Bjornsone, Oswald, jun., Esq. *Wherstead-park, Ipswich, Suffolk.*

1858 Blumberg, George F., Esq. 4, *Lalbroke-square, Kensington-park, W.*

1837 *Blunt, Jos., Esq.

1863 *Blunt, Wilfrid, Esq.

1858 Blyth, Philip P., Esq. (J.P. for Middlesex). 53, *Wimpole-street, W.*

1858 Bohn, Henry G., Esq. *York-street, Covent-garden, W.C.; and North-end-house, Twickenham, S.W.*

1850 Bollaert, William, Esq. 21A, *Hanover-square, W.*

1862 220 Bolton, Capt. Francis John, 12th Regt. *Chatham.*

1861 Bompas, George Cox, Esq. 15, *Stanley-gardens, Kensington-park, W.*

1864 Bone, John William, Esq., B.A., F.R.S.L., F.S.S. 26, *Bedford-place, Russell-square, W.C.*

1861 Bonney, Charles, Esq. *Adelaide, Australia.*

1858 Bonnor, George, Esq. 49, *Pall-mall, S.W.; and* 2, *Bayswater-ter., Kensington-square, W.*

1865 Bonwick, James, Esq. *St. Kilda, Melbourne. Care of W. Bodkin, Esq.*, 22, *South Audley-street, W.*

1866 Booker, Wm. Lane, Esq. *Care of F. F. Alston, Esq., Foreign Office.*

1859 Borough, Sir Edward, Bart. 4, *Nassau-street, Dublin.*

1845 *Borrer, Dawson, Esq. *Altnent Ballou, Co. Carlow, Ireland.*

1856 *Botchesby, Blackett, Esq., M.A. 174, *Brompton-road, S.W.*

1858 230*Botterill, John, Esq. *Flower-bank, Burley-road, Leeds.*

1860 Boustead, John, Esq. 34, *Craven-street, Strand, W.C.*

1866 *Boutcher, Emanuel, Esq. 12, *Oxford-square, Hyde-park, W.*

1865 Bouverie, P. P., Esq. 32, *Hill-street, Berkeley-square, W.*

1855 Bovet, Charles, Esq. 135, *Camden-road, N.W.*

1867 Bowell, Wm., Esq. *Chandos-house, Hereford; and Gate-house Grammar-school, Hereford.*

1861 *Bowen, Charles Christopher, Esq. *Christchurch, Canterbury, New Zealand. Care of A. O. Ottywell, Esq., 16, Charing-cross, S.W.*

1854 *Bowen, Sir George Ferguson, K.C.M.G., M.A. *Governor of New Zealand.*

1866 Bower, Anthony Maw, Esq.

Year of Election.		
1862		Bowie, John, Esq. *Conservative Club, S.W.*
1869	240	Bowker, James Henry, Esq. *Basutuland, South Africa. Care of Messrs. King and Co., Cornhill, E.C.*
1868		Bowly, William, Esq. *Cirencester.*
1856		Bowman, John, Esq. 9, *King William-street, E.C.*
1869		Bowra, E. C., Esq., Commissioner of Maritime Customs. *Ningpo, China.*
1865		Bowring, John Charles, Esq. *Larkbeare, Exeter.*
1866		Bowring, Samuel, Esq. 1, *Westbourne-park, W.*
1868		Bowser, Alfred T., Esq. *Cromwell-house, Highbury, N.E.*
1862		Boyce, Rev. W. B., Secretary to Wesleyan Missionary Society. *Wesleyan Mission House, Bishopsgate-street, E.C.*
1845		*Boyd, Edward Lennox, Esq., F.S.A. 35, *Cleveland-square, Hyde-park, W.*
1865		Boyle, Frederick, Esq. *The Firs, Bebington, Cheshire.*
1869	230	Boyle, Richard Vicars, Esq., M.I.C.E., &c. 9, *Stanhope-place, Hyde-park, W.*
1856		Boyne, G. Hamilton-Russell, Viscount. 22, *Belgrave-square, S.W.; Brancepeth-castle, Durham; and Burwarton-hall, Ludlow, Salop.*
1851		Bracebridge, Charles Holte, Esq. *Atherstone, Warwick.*
1862		Braithwaite, Isaac, Esq. 68, *Old Broad-street, E.C.*
1863		*Bramley-Moore, John, Esq. *Langley-lodge, Gerrard's Cross, Bucks.*
1859		*Brand, James, Esq. 102, *Fenchurch-street, E.C.*
1868		Brand, Jas. Ainsworth, Esq. 42, *Mornington-road, Regent's-park, N.W.*
1867		Brandis, Dr. D., F.L.S. *Director of Forests, Calcutta. Care of W. H. Allen, Esq., 13, Waterloo-place, S.W.*
1860		Brassey, T., Esq. 4, *Great George-street, S.W.; and 36, Lowndes-square, S.W.*
1859		Brayshooke, Philip Watson. *Assistant Colonial Secretary, Ceylon. Messrs. Price and Co., Craven-street.*
1861	269	*Brenchley, Julius, Esq. *Oxford and Cambridge Club, S.W.; and Milgate, near Maidstone, Kent.*
1846		Brereton, Rev. C. D., M.A. *Little Massingham, Rougham, Norfolk.*
1835		*Brereton, Rev. John, LL.D., F.S.A. *Bedford.*
1834		*Breton, Wm. Henry, Esq., Commd. R.N., M.R.I. 15, *Camden-crescent, Bath.*
1862		Brett, Charles, Esq.
1867		Bridge, John, Esq. *Altrincham, Cheshire.*
1858		Bridges, Nathaniel, Esq.
1852		*Brierly, Oswald W., Esq. 8, *Lidlington-pl., Harrington-sq., Hampstead-rd., N.W.*
1865		Briggs, Major, J. P.
1861		*Bright, Sir Charles T., F.R.A.S. 6, *Westminster-chambers, Victoria-street, S.W.; and 69, Lancaster-gate, W.*
1868	270	Bright, Henry Arthur, Esq. *Ashfield, Knotty Ash, Liverpool.*
1850		Bright, James, Esq., M.D. 12, *Wellington-square, Cheltenham.*
1854		Brine, Major Frederic, R.E., F.R.S., Executive Engineer, Punjaub. *Athenæum Club, S.W., Army and Navy Club, S.W. Care of Mrs. F. Brine, Edgemoor, Torquay.*
1856		Brine, Captain Lindesay, R.N. *Army and Navy Club, S.W.; All Saints' Rectory, Axminster. Care of Messrs. Woodhead.*
1861		Bristowe, Henry Fox, Esq.

Year of Election		
1861		Brandwater, Robert, Esq. 3, *Billiter-square, Fenchurch-street, E.C.*
1864		Brodie, G. S., Esq. 27, *Pembridge-square, W.*
1861		Brodie, Walter, Esq. 13, *Delamere-terrace, Hyde-park, W.*
1861		Brodie, William, Esq. *Eastbourne, Sussex.*
1865		*Brodrick, Hon. George C. 32A, *Mount-street, W.*
1864	280	*Brooke, Sir Victor A., Bart. *Colebrooke-park, Co. Fermanagh, Ireland.*
1862		Brookes, Thomas, Esq. *Mattock-lane, Ealing, W.*
1856		*Brooking, George Thomas, Esq. 25, *Sussex-gardens, Hyde-park, W.*
1856		*Brooking, Marmaduke Hart, Esq. 11, *Montagu-place, Bryanston-square, W.*
1863		*Broughall, William, Esq. *Broadwater, Down, Tunbridge-wells.*
1868		Brown, Col. David (Madras Staff Corps). 14, *St. James's-square, S.W.*
1856		*Brown, Daniel, Esq. *The Elms, Larkhall-rise, Clapham, S.*
1864		Brown, Edwin, Esq., F.G.S. *Burton-on-Trent.*
1867		Brown, Geo. H. Wilson, Esq. *Victoria, Vancouver Island, British Columbia. Care of H. C. Beeton, Esq., 3, Bow-churchyard, E.C.*
1860		Brown, James, Esq. *Ecclington, Yorkshire.*
1863	190	Brown, James P., Esq. *Cocoza, Brazil. Care of Mr. C. Williams, 25, Poultry, E.C.*
1865		*Brown, James R., Esq., F.R.A.S.N.A. Copenhagen. 5, *Langham-chambers, Langham-place, W.*
1867		Brown, Rev. J. C., LL.D., &c. *Haddington, Scotland.*
1861		*Brown, John Allen, Esq. *The Laurels, The Haven, Ealing, W.*
1867		Brown, Richard, Esq., C.E. 115, *Lansdowne-road, Notting-hill, W.*
1867		Brown, Robert, Esq. 4, *Gladstone-terrace, Hope-park, Edinburgh.*
1856		*Brown, Samuel, Esq. 11, *Lombard-st., E.C.; and The Elms, Larkhall-rise, Clapham, S.*
1858		*Brown, Thomas, Esq. 8, *Hyde-park-terrace, Hyde-park, W.*
1859		Brown, William, Esq. *Loat's-road, Clapham-park, S.*
1863		Browne, H. H., Esq. 70, *Westbourne-park-villas, Harrow-rd., Paddington, W.*
1869	300	Browne, John Comber, Esq., Superintendent and Inspector of Government Schools. *Port Louis, Mauritius.*
1869		Browne, Samuel Woolcott, Esq. 77, *Gloucester-terrace, Hyde-park, W.*
1864		*Browne, Capt. Wade. 6, *Charles-street, Berkeley-square, W.*
1858		Browne, William J., Esq. *Marston-lodge, Pitville, Cheltenham.*
1869		Browning, George Frederick, Esq. *Weston School, Bath.*
1852		Browning, H., Esq. 73, *Grosvenor-street, Grosvenor-square, W.; and Old Warden-park, Biggleswade.*
1856		*Browning, Thomas, Esq. 6, *Whitehall, S.W.*
1859		Bruce, Henry Austin, Esq. *Dyffryn, Aberdare, Glamorganshire.*
1865		Brunton, John, Esq., M.I.C.E., F.G.S. *Care of Messrs. Willis and Sotheran, Charing-cross, S.W.*
1856		Bryant, Walter, Esq., M.D., F.R.C.S. 7, *Bathurst-street, Hyde-park-gardens, W.*
1843	310	*Buchan, John Hitchcock, Esq. *The Grove, Hanwell, W.*
1867		*Buccleuch, his Grace the Duke of, K.G., F.R.S. *Dalkeith Palace, near Edinburgh; and Montagu-house, Whitehall, S.W.*

Year of Election	
1859	Buckland, Edward C., Esq. 36, *Lansdowne-road, Notting-hill, W.*
1869	Buckley, John, Esq. *Care of Messrs. Dalgety, Du Croz, and Co., 52, Lombard-street, E.C.*
1863	Budd, J. Palmer, Esq. *Care of J. J. Milford, Esq., 13, Austin-friars, E.C.*
1867	*Bulger, Capt. George Ernest, F.C.S., &c. *Care of Mr. Booth, 307, Regent-st., W.*
1868	*Bull, William, Esq., F.L.S. *King's-road, Chelsea, S.W.*
1865	Buller, Sir Edward M., Bart., M.P. *Old Palace-yard, S.W.; and Dillhorn-hall, Cheadle, Staffs.*
1869	Buller, Walter L., Esq., F.L.S. *Wanganui, New Zealand.*
1863	Bullock, Commander Charles J., R.N. *Hydrographic-office, S.W.*
1830	*Bullock, Rear-Admiral Frederick. *Woolwich, S.E.*
1860	320*Bunbury, Sir Charles James Fox, Bart.; F.R.S. *Barton-hall, Bury St. Edmund's.*
1839	Bunbury, E. H., Esq., M.A. 85, *St. James's-street, S.W.*
1853	Bundock, F., Esq. *Windham Club, S.W.*
1861	Burges, William, Esq. *Fethard, Co. Tipperary.*
1866	Burgess, James, Esq., M.R.A.S., Principal of Sir J. Jejeebhoy's Parsee B. Institution, *Hornby-row, Bombay. Care of J. McGlashan, Esq., 31, Essex-st., Strand, W.C.*
1863	Burgoyne, Capt. Hugh Talbot R.N., V.C. 8, *Gloucester-gardens, Hyde-park, W.*
1864	Burn, Robert, Esq. 5, *Clifton-place, Sussex-square, W.*
1863	*Burns, John, Esq. 1, *Park-gardens, Glasgow; and Castle Wemyss, by Greenock, N.B.*
1861	*Burr, Higford, Esq. 23, *Eaton-place, S.W.; and Aldermaston-court, Berkshire.*
1857	Burstal, Capt. E., R.N. 6, *Park-villas, Lower Norwood, S.*
1830	310*Burton, Alfred, Esq. 36, *Marina, St. Leonard's.*
1833	*Burton, Decimus, Esq., F.R.S. 37, *Gloucester-gardens, Hyde-park, W.*
1859	*Burton, Capt. Richd. Fras., 18th Regt. Bombay N.I., H.B.M. Consul at Damascus. 14, *St. James's-square, S.W. Care of R. Arundell, Esq., Admiralty, Somerset House, W.C.*
1869	Burton, William Samuel, Esq. *South-villa, Regent's-park, N.W.*
1858	Bury, William Coutts, Viscount. 48, *Rutland-gate, S.W.*
1861	Bush, Rev. Robert Wheler, M.A. 1 *Milner-square, Islington, N.*
1868	Busk, William, Esq., M.C.P., &c. 28, *Bessborough-gardens, S.W.*
1841	Butler, Charles, Esq. 3, *Connaught-place, Hyde-park, W.*
1867	Butler, E. Dundas, Esq. *Geographical Department, British Museum, W.C.*
1860	*Butler, Rev. Thomas. *Rector of Langar, Nottinghamshire.*
1862	340*Buxton, Chas., Esq., M.P. 7, *Grosvenor-crescent, S.W.; and Fox-warren, Surrey.*
1869	Buxton, Henry Edmund, Esq., B.A. 3, *Hanover-terrace, Regent's-park, N.W.*
1858	*Buxton, Sir Thomas Fowell, Bart. *Brick-lane, N.E.*
1866	Byass, Robert B., Esq. *Melville-park, Tunbridge-wells.*
1864	Bythesea, Capt. J., R.N., V.C. 20, *Grosvenor-place, Bath. Care of G. J. Noel, Esq., Admiralty, S.W.*

Year of Election.	
1830	*Cabbell, B. B., Esq., M.A., F.R.S., F.S.A. 1, *Brick-court, Temple, E.C.*; 52, *Portland-place, W.*; and *Aldenham, Sussex.*
1866	Caldbeck, Capt. J. B. (P. and O. Sup. at Aden). 17, *West Mall, Clifton, and* 122, *Londesbell-street, E.C. Care of Mrs. Caldbeck, 76, Englefield-road, N.*
1863	Callaghan, Thos. F., Esq. *Garrick Club, W.C.*
1861	Calthorpe, the Hon. Augustus Gough. 33, *Grosvenor-square, W.*
1855	*Calthorpe, F. H. Gough, Lord. 33, *Grosvenor-square, W.*
1854	350 Calvert, Frederic, Esq., Q.C. 5, *Tenley-street, Park-lane, W.*; and 8, *New-square, Lincoln's-inn, W.C.*
1858	Cameron, Capt. Charles D. *Care of E. Hertslet, Esq., Foreign-office, S.W.*
1861	Cameron, Donald, Esq., M.P. *Auchnacarry, Invernesshire.*
1858	Cameron, Major-General Sir Duncan Alexander, K.H. C.B. *New Zealand.*
1864	Cameron, J., Esq. *Singapore. Care of Messrs. H. S. King and Co.*
1866	Cameron, R. W., Esq. *Staten Island, New York. Care of Messrs. Brooks and Co., St. Peter's-chambers, Cornhill, E.C.*
1861	Campbell, Capt. Frederick, R.N. 12, *Connaught-place, Hyde-park, W.*
1866	Campbell, George, Esq. 60, *St. George's-square, Pimlico, S.W.*; and *Athenæum Club, S.W.*
1844	*Campbell, James, Esq. *Grove-house, Hendon, Middlesex*; and 37, *Seymour-street, W.*
1857	Campbell, James, Esq., Surgeon R.N. *Bangkok, Siam. Care of Messrs. H. S. King and Co.*
1834	360 *Campbell, James, Esq., jun. *Hampton-court-green, S.W.*
1863	*Campbell, James Duncan, Esq. *Peking. Care of H. C. Batchelor, Esq., 150, Cannon-street, E.C.*
1869	Campbell, Robert, Esq., J.P. 31, *Lowndes-square, S.W.*; and *Buscot-park, Lechlade, Gloucestershire.*
1857	Campe, William, Esq., M.D. 84, *Park-street, Grosvenor-square, W.*
1866	Canning, Sir Samuel, C.E. *The Manor-house, Abbots Langley, near Watford, Herts.*
1864	Cannam, John Wm., Esq. *Castle-grove, Truro.*
1857	Cannon, Lieut.-General R. 10, *Kensington-gardens-terrace, W.*
1853	*Cardwell, Right Hon. Edward, M.P. 74, *Eaton-square, S.W.*
1863	*Carew, R. Russell, Esq., J.P. *Carpenders-park, Watford, Herts*; and *Oriental Club, W.*
1869	Carey, Rev. Tupper. *Fifield, Bavant, Salisbury.*
1862	370 Cargill, John, Esq., Member of the Legislative Assembly of New Zealand and Legislative Council of Otago. *Dunedin, Otago, New Zealand.*
1863	*Cargill, Wm. W., Esq. 4, *Connaught-place, Hyde-park, W.*
1864	*Carmichael, L. M., Esq., M.A., 5th Lancers. *Oxford and Cambridge Club, S.W.*
1865	*Carnegie, David, Esq. *Westbury, by Watford, Herts.*
1863	Carnegie, Commander, the Hon. J., R.N. 26, *Pall-mall, S.W.*
1869	Carr, William, Esq. *Dene-park, near Tunbridge.*

Year of Election		
1864		Carrington, R. C., Esq. *Admiralty, S.W.*
1861		Carter, Captain Hugh Bonham, Coldstream Guards. *Guards' Club, S.W.; and* 1, *Carlisle-place, Victoria-street, S.W.*
1868		Carter, Thomas Tapper, Esq., Lt. R.E. *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall.*
1860		Cartwright, Capt. Henry, F.R.A. *Barbham-lodge, Gloucester.*
1857	380	Cartwright, Col. Henry, Grenadier Guards, M.P. 1, *Tilney-street, Park-street, Grosvenor-square, W.*
1860		*Carver, the Rev. Alfred J., D.D., Master of Dulwich College. *Dulwich, S.E.*
1858		Casella, Louis P., Esq. 23, *Hatton-garden, E.C.; and South-grove, Highgate, N.*
1860		Cave, Amos, Esq. 109, *New-road, Kennington-park, S.; and Rathbone-place, Oxford-street, W.*
1857		Cave, Capt. Laurence Trent. 75, *Chester-square, W.*
1858		Cave, Right Hon. Stephen, M.P. 35, *Wilton-place, S.W.*
1863		Challis, John Henry, Esq. *Reform Club, S.W.*
1865		Chambers, Charles Harcourt, Esq., M.A. 2, *Chesham-place, S.W.*
1864		Chambers, David, Esq. *Paternoster-row, E.C.*
1858		Champion, John Francis, Esq. *High-street, Shrewsbury.*
1866	390	*Chenalles, Wm., Esq., R.A. 1, *Gloucester-place, Portman-square, W.*
1867		Chapman, James, Esq. *Cape Town, Cape of Good Hope.*
1863		*Chapman, Spencer, Esq. *Hookampton, S.W.*
1860		Charlemont, Lord. *Charlemont-house, Dublin.*
1861		Charnock, Richard Stephen, Esq., PH.D*., F.R.A. 8, *Gray's-inn-square, W.C.; and The Grove, Hammersmith.*
1864		Cheadle, Walter, Esq., B.A., M.D. Camb. 2, *Hyde-park-place, Cumberland-gate, W.*
1861		Cheetham, John Frederick, Esq. *Eastwood, Stalybridge.*
1855		Cheshire, Edward, Esq. *Conservative Club, S.W.*
1858		*Chesney, Major-General Francis Rawdon, R.A., D.C.L., F.R.S. *Athenæum Club, S.W.; and Ballycastle, Down, Ireland.*
1858		Chetwode, Augustus L., Esq. 7, *Suffolk-street, Pall-mall-east, S.W.; and Chilton-house, Thame, Oxfordshire.*
1858	400	Childers, Right Hon. Hugh C. E., M.P. 17, *Prince's-gardens, W.; and Australia.*
1858		Childers, John Walbanke, Esq. *Cantley-hall, near Doncaster.*
1857		*Chimmo, Commr. William, R.N. *Hydrographic-office, S.W.*
1869		Chimnock, Frederick George, Esq. 37, *Portland-place, W.*
1830		*Church, W. H., Esq.
1849		Churchill, Lord Alfred Spencer. 16, *Rutland-gate, S.W.*
1856		Churchill, Charles, Esq. *Weybridge-park, Surrey.*
1853		Clarendon, George William, Earl of, K.G., G.C.B. 1, *Grosvenor-crescent, S.W., The Grove, Watford, Herts; and Hindon, Wilts.*
1863		Clark, Lieut. Alex. J. 14, *St. James's-square, S.W.; and Evercell-house, Malvern, Newport, Monmouthshire.*
1866		Clark, J. Howarth, Esq. *Cheetham Collegiate-school, Manchester.*
1840	410	*Clark, Sir James, Bart., M.D., F.R.S. *Bagshot-park, Surrey.*

Year of Election	
1858	Clark, John Gilchrist, Esq. *Speddock, Dumfries, Dumfriesshire.*
1862	Clark, Latimer, Esq. 1, *Victoria-street, Westminster, S.W.; and Cairo.*
1848	Clark, William, Esq. *The Cedars, South Norwood.*
1859	Clark, Rev. W. Geo., M.A. *Trinity College, Cambridge.*
1865	Clark, W. H., Esq. 6, *Leinster-terrace, Hyde-park, W.*
1859	Clarke, Capt. A., R.E. *Army and Navy Club, S.W.*
1853	*Clarke, Rev. W. B., M.A. *St. Leonard's, Sydney, New South Wales. Care of Messrs. Richardson, Cornhill.*
1868	Clarke, W., Esq. 15, *Ladbroke-grove, W.*
1862	Claude, Eugène, Esq. *Ville Helvetia, Carlton-road, Tufnell-park, N.*
1842	420*Clavering, Sir William Aboyne, Bart., M.A. *United University Club, S.W. Axwell-park, near Gateshead; and Greencroft, Durham.*
1863	Clayton, Capt. John W., late 15th Hussars. 14, *Portman-square, W.*
1866	Clayton, Sir W. R. *Harleyford, Great Marlow, Bucks.*
1866	*Cleghorn, Hugh, Esq., M.D., Conservator of Forests, Madras. *Stravithy, St. Andrew's.*
1863	Clements, Rev. H. C. *United University Club, S.W.*
1860	Clerk, Capt. Claude. *Military Prison (Queen's Bench), Southwark, S.*
1858	Clermont, Thomas, Lord. *Ravensdale-park, Newry, Ireland.*
1845	*Cleveland, His Grace the Duke of. *Cleveland-house, 17, St. James's-square, S.W.*
1861	Clifford, Sir Charles. *Compden-house, Broadway, Worcestershire.*
1858	Clifford, Charles Cavendish, Esq. *House of Lords, S.W.*
1866	430 Clinton, Lord Edward. *Army and Navy Club, S.W.*
1853	Clipperton, Robert Charles, Esq., H.B.M. Consul, Kertch. *Care of T. G. Stanley, Esq., Foreign Office, S.W.*
1856	Clive, Rev. Archer. *Whitfield, Hereford.*
1863	Clowes, E., Esq. *Salisbury-square, Fleet-street, E.C.*
1854	Clowes, George, Esq. *Duke-street, Stamford-street, Blackfriars, S.E.; Charing-cross, S.W.; and Surbiton, Surrey.*
1864	Clowes, Rev. George, B.A. *Surbiton, Surrey.*
1854	Clowes, William, Esq. *Duke-street, Stamford-street, Blackfriars, S.E.; Charing-cross, S.W.; and 51, Gloucester-terrace, Hyde-park, W.*
1861	Clowes, William Charles Knight, Esq., M.A. *Duke-street, Stamford-street, Blackfriars, S.E.; and Surbiton, Surrey.*
1852	Cobbold, John Chevalier, Esq. *Athenæum Club, S.W.; and Ipswich, Suffolk.*
1859	*Cochrane, Capt. the Hon. A., R.N., C.B. *Junior United Service Club, S.W.*
1859	440 Cockburn, Captain James George, Bengal Pioneer, Bengal. *Care of Colonel Cockburn, Broom Ash, Norwich.*
1862	Cockerton, Richard, Esq. 12, *Peterborough-terrace, South Kensington, W.*
1862	Cockle, Captain George. 9, *Bolton-gardens, South-Kensington, W.*
1859	Cocks, Colonel C. Lygon, Coldstream Guards. *Crediton, Devon.*
1865	Cocks, Major Octavius Yorke. 180, *Piccadilly, W.*
1841	*Cocks, Reginald Thistlethwayte, Esq. 43, *Charing-cross, S.W.; and 22, Hertford-street, Mayfair, W.*

Year of Election		
1857		Coghlan, Edward, Esq. *Training-institution, Gray's-inn-road, W.C.*
1861		Coghlan, J., Esq., Engr.-in-Chief to the Government. *Buenos Ayres. Care of Messrs. J. Fair and Co., 4, East India-avenue, Leadenhall-street, E.C.*
1862		Coghlan, Major Gen. Sir William M., K.C.B., R.A. *Ramsgate, Kent.*
1865		Colchester, Reginald Charles Edward, Lord. *All Souls' College, Oxford.*
1868	450	Cole, William H., Esq. 23, *Portland-place, W.*
1867		Colebrook, John, Esq. 15, *St. Leonard's-terrace, King's-road, Chelsea, S.W.*
1841		*Colebrooke, Sir Thomas Edward, Bart., F.R.A.S. 37, *South-st., Park-lane, W.*
1834		Colebrooke, Lt.-General Sir Wm., R.A., M.G., C.B., K.H., F.R.A.S. *Datchet, near Windsor; and United Service Club, S.W.*
1854		Coleman, Everard Home, Esq., F.R.A.S. *Registry and Record Office, Adelaide-place, London-bridge, E.C.*
1848		Coles, Charles, jun., Esq. 88, *Great Tower-street, E.C.*
1855		*Collett, William Eickford, Esq. *Carnarvon; and Carlton Club, S.W.*
1867		Collier, C. T., Esq. (Barrister of the Middle Temple). *Cedarcroft, Sutton, Surrey; and Oriental Club, W.*
1858		Collinson, Henry, Esq.
1856		Collinson, John, Esq., C.E. 9, *Clarendon-gardens, Maida-hill, W.*
1855	460	Collinson, Vice-Admiral Richard, C.B. *Heron-lodge, Ealing, W.; and United Service Club, S.W.*
1856		Collum, Francis, Esq. *Heron-hill, Surrey, S.*
1864		Colnaghi, Dominic E., Esq. *Care of F. B. Alston, Esq., Foreign-office, S.W.*
1862		Colquhoun, Sir Patrick, M.A.
1866		Colquhoun, Sir Robert G., K.C.B. 6, *Ulster-terrace, Regent's-park, N.W. and 14, Arlington-street, W.*
1869		Colvill, William H., Esq., Surg. H.M. Ind. Army. *Lazee-lonk, Hampstead; and Baghdad.*
1851		*Colville, Charles John, Lord. 42, *Eaton-place, S.W.*
1865		Colvin, Binney J., Esq. 71, *Old Broad-street, E.C.*
1868		Colvin, Captain W. B. *Shirley-cottage, Croydon.*
1868		Combe, Lieut. B. A.
1861	470	Combe, Thomas, Esq., M.A. *University Press, Oxford.*
1864		Commerell, Commr. J. E., R.N., F.C. *Aberbank, near Gosport.*
1864		Cumber, John, Esq. *Halbrooke-house, New Wandsworth, S.W.*
1868		Conev, Rev. T., M.A. *Chaplain to the Forces, Chatham.*
1861		Constable, Capt. Chas. Golding, I.N. 68, *Hamilton-ter., St John's-wood, N.W.*
1868		Cook, Edward, Esq. *Kingston-on-Thames.*
1868		Cook, H. Esq., M.D., &c. (Care of Messrs. Forbes and Co.) 12, *Leadenhall-st., E.C.*
1863		Cooke, Lt.-Colonel A. C., R.E. *Topographical Department, 4, New-street, Spring-gardens, S.W.*
1863		*Cooke, E. W., Esq., A.R.A., F.R.S., F.L.S., F.Z.S., F.G.S., Accad. Bell. Art. Venet. et Hulm Socius. *Glen-Andred, Groombridge, Sussex, and Athenæum Club, S.W.*
1856		Cooke, John George, Esq. 18, *Pelham-place, Brompton, S.W.*
1866	480	Cooke, Rev. J. Hunt. *Victoria-house, Southsea, Hants.*
1860		Cooke, Nathaniel, Esq. 5, *Ledbrooke-terrace, Notting-hill, W.*

Year of Election	
1852	Cooke, Robt. F., Esq. 30, *Albemarle-street, W.*
1860	Cooke, William Henry, Esq., Barrister-at-Law. 4, *Elm-court, Temple, E.C.*
1830	Cooley, William Desborough, Esq. 15, *College-place, Camden-town, N.W.*
1862	Cooper, Sir Daniel. 20, *Prince's-gardens, Hyde-park, S.W.*
1856	Cooper, Lt.-Col. Edward, Grenadier Guards. 5, *Bryanston-square, W.*
1860	Cooper, Lt.-Col. Joshua H., 7th Fusiliers. *Dunboden, Mullingar.*
1857	*Coote, Captain Robert, R.N. *Shales, Bittern, Southampton.*
1862	Coxe, Walter, late H.M.'s Chargé d'Affaires at the Equador. 14, *The Terrace, Camberwell, S.*
1853	490 Copley, Sir Joseph William, Bart. *Sprotborough, Doncaster.*
1864	Cork and Orrery, Earl of. 1, *Grafton-street, W.*
1868	Cock, Nathaniel, Esq. *Ivy-lodge, 9, Warwick-road, Upper Clapton, N.E.*
1868	Corner, William M., Esq. *Colden-house, Leytonstone; and 104, Leadenhall-street, E.C.*
1858	*Cornish-Brown, Charles, Esq. 7, *Lansdowne-place, Clifton, Bristol.*
1863	Cornthwaite, Rev. T., M.A. *Forest, Walthamstow.*
1860	Cornwell, James, Esq., FH. DR. *Tree'er-bys, Dartmouth-park, Forest-hill.*
1859	*Corrance, Frederick, Esq. *Parkham-hall, Wickham Market, Suffolk.*
1868	Cory, Frederic C., Esq., R.N. 8, *Nassau-place, Commercial-road, E.*
1869	Coster, Guillaume F., Esq. 11, *Park-crescent, Regent's-park, N.W.*
1853	505*Conway, William Halliday, Esq. *Oxford and Cambridge Club, S.W.*
1863	Courtenay, L. W., Esq. *British Post-office, Constantinople. Care of R. Wood, Esq.*, 139, *Fleet-street.*
1865	Cowan, John K., Esq. 38, *Denbigh-street, S.W.*
1862	Coward, William, Esq. 7, *Southsea-terrace, Southsea, Portsmouth.*
1857	*Cowell, Major Sir J. C., K.C.B., R.E. *Buckingham-palace, S.W.*
1854	Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square, W.*
1862	Cowper, Sedgwick S., Esq. *Rockwood, Rockhampton, Queensland.*
1862	Cox, Mr. Serjeant, Barrister-at-Law, Recorder of Falmouth. 1, *Essex-court, Temple, E.C.; and Mont-rowood, High-wood, Middlesex.*
1865	Coysh, John S., Esq. *Levant-house, 81, Hehn's-place, E.C.*
1867	Crane, Leonard, Esq., M.D. 7, *Albemarle-street, W.*
1857	520 Crauford, Lieut.-General James Robertson, Grenadier Guards. *Travellers' Club, S.W.*; and 26, *Prince's-gardens, W.*
1848	Crawford, Robert Wigram, Esq., M.P. 71, *Old Broad-street, E.C.*
1866	Crawford, O. J., Esq. *Athenæum Club, S.W.*
1861	Caswell, Rev. S. F., M.A. *The Grammar School, Dartford, North Kent.*
1858	*Cayke, Capt. Richard Boynton, R.N. *Ulverstone, Lancashire.*
1858	Cocker, T. F. Dillon, Esq. 19, *Pelham-place, Brompton, S.W.*
1864	Cecil, A. A., Esq., C.E. *Southwood, Southwood-lane, Highgate.*
1858	Cecil, Alex., Esq. 16, *The Sedens, Brompton, S.W.*
1861	*Crosley, J. Sudbury, Esq. *Forest-house, High Beech, Essex.*
1869	Crowe, the Rev. Thomas, D.C.L., M.R.A.S. *Hastings.*
1862	530 Crommelin, James Hewett, Esq. *Belle-park, Chigwell, Essex.*

Year of Election	
1863	*Crowder, Thos. Manley, Esq., M.A. *Thornton-hall, Beckdale, Yorkshire.*
1852	Crowdy, James, Esq. 17, *Serjeant's-inn, E.C.*
1859	Cull, Richard, Esq., F.S.A. 13, *Tavistock-street, Bedford-square, W.C.*
1857	Cumming, William Fullarton, Esq., M.D. *Athenæum Club, S.W.; and Kinellan, Edinburgh.*
1860	Cunliffe, Roger, Esq. 24, *Lombard-street, E.C.; and* 10, *Queen's-gate, South Kensington, W.*
1864	Cunningham, R. Esq.
1853	Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house, W.C.; and Harrow, N.W.*
1862	*Cunyngham, Major-Gen. A. T., C.B. *Commanding Dublin Division, Royal Barracks, Dublin.*
1865	Cure, Capel, Esq. 51, *Grosvenor-street, W.*
1868	530 Currie, A. A. Hay, Esq., C.E. *The Manor-house, Tunbridge-wells.*
1843	*Cursetjee, Manockjee, Esq., F.S.S.,M.A. *Villa-Byculla, Bombay.*
1839	*Curtis, Timothy, Esq.
1865	Curzon, Hon. R. 24, *Arlington-street, W.; and Parham-park, Steyning, Sussex.*
1867	Cuttance, John Fras. J., Esq. *Cleveland-house, Grenville-road, Kilburn, N.W.*
1864	Dallas, A. G., Esq. 36, *Beaufort-gardens, W.*
1863	*Dalgety, Fred. G., Esq. 8, *Hyde-park-terrace, W.*
1865	D'Almeida, W. B., Esq. 19, *Green-park, Bath.*
1863	Dalrymple, Donald, Esq. *Thorpe-lodge, Norwich.*
1867	Dalrymple, Gen. Elphinstone, Esq. *Logie, Elphinstone, Aberdeenshire.*
1857	540 Dalton, D. Foster Grant, Esq. *Shute-house, near Wincanton, Somerset.*
1859	Dalyell, Sir Robt. Alex. Osborn, Bart. *H.M.'s Consul at Jassy; and* 120, *Belgrave-road, S.W.*
1868	Dalziel, William R., Esq. 3, *Grosham-park, Brixton, S.*
1866	Damer, Lt.-Col. Lionel S. Dawson. 2, *Chapel-street, Grosvenor-square, W.*
1862	Darvall, John Bayly, Esq.
1838	*Darwin, Charles, Esq., M.A., F.R.S. 6, *Queen Anne-street, Cavendish-square, W.*
1860	Daunt, John Bury, Esq. 22, *Warwick-road, Maida-hill, W.*
1863	Davies, R. H., Esq.
1866	Davis, Edmund V., Esq. 6, *Cork-street, Bond-street, W.*
1858	Davis, Dr. Francis William, Surgeon R.N. *H.M.S. 'Alert'; and Elm-lodge, St. Ann's-hill, Wandsworth, S.W.*
1866	550 Davis, Frederick E., Esq. 20, *Blomfield-square, N.W.*
1856	Davis, Richard, Esq. 9, *St. Helen's-place, E.C.*
1851	Davis, Staff-Commander John Edward, R.N. *Hydrographic-office, Admiralty, S.W.*

Year of Election		
1846		Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. *Athenæum Club, S. W. and Hollywood, near Bristol.*
1840	*	Dawnay, the Hon. Payan. *Beningborough-hall, Newton-upon-Ouse, Yorkshire.*
1865		Debary, Rev. Thomas, M.A. 35, *Mount-street, W.*
1866		Debenham, William, Esq. 3, *Porchester-square, Hyde-park, W.*
1859		De Blaquiere, John, Lord. 9, *Stratford-place, W.*
1858		De Bourgho, T. J., Esq. 6, *Charing-cross, S.W.*
1850		De Crespigny, Lieut. C., R.N.
1856	560	De Gex, William Francis, Esq. 25, *Thregmorton-street, E.C.*
1853		De Grey and Ripon, George Frederick Samuel, Earl. 1, *Carlton-gardens, S. W.; and Studley Royal, Ripon.*
1865		De Lacki, A., Esq.
1869		De Lara, Dr. Hannel. 15, *Holland-villas-road, Kensington, W.*
1868		Dell, William, Esq. *Messrs. Combe, Delafield, and Co., Long Acre.*
1862		Denham, Adm. Sir Henry Maugles, K.N., K.C.B. 21, *Carlton-road, Maida-vale, W.*
1860		Denison, Alfred, Esq. 6, *Albemarle-street, W.*
1834	*	Denison, Sir William Thomas, K.C.B., Lieut.-Col. R.E., F.R.S. *Observatory, East Sheen.*
1836		Denman, Rear-Admiral the Hon. Joseph. *Commander-in-Chief, Pacific; and 17, Eaton-terrace, S. W.*
1853	*	Derby, Edward Henry, Earl of, P.C., LL.D., D.C.L. 23, *St. James's-square, S. W.; and Knowsley-park, Prescott, Lancashire.*
1867	370	De Salis, Col. Rodolph, C.B. 123, *Pall-mall, S. W.*
1853		De Wesselow, Lieut. Frns. G. Stapkinson, R.N. 55, *Victoria-street, Westminster, S. W.*
1854	*	Devanz, Alexander, Esq. 2, *Acacia-road, Regent's-park, N. W.*
1857	*	Devonshire, William Cavendish, Duke of, LL.D., D.C.L., M.A., F.R.S. *Devonshire-house, Piccadilly, W.; and Hardwicke-hall, Derbyshire.*
1864		Dick, A. H. Esq., M.A., L.L.B. *Free Church Normal College, Glasgow.*
1862		Dick, Capt. Charles Cramond. *Exeter, Devon.*
1866	*	Dick, Fitzwilliam, Esq., M.P. 20, *Curzon-street, Mayfair, W.*
1861		Dick, Robert Kerr, Esq., Bengal Civil Service. *Oriental Club, W.*
1866		Dick, William Graeme, Esq. 29, *Leinster-square, W.*
1854	*	Dickenson, Sebastian Stewart, Esq., M.P., Barrister-at-Law. *Brown's-hill, Stroud, Gloucestershire.*
1858	580	* Dickinson, Francis Henry, Esq., F.S.A. 110, *St. George's-square, Pimlico, W.; and Kingweston-park, Somerset.*
1852		Dickinson, John, Esq., jun. 3, *Essex-court, Temple, E.C.; and Abbott's-hill, Hemel-Hempstead.*
1859		Dickson, A. Benson, Esq. 4, *New-square, Lincoln's-inn, W.C.*
1858		Dickson, Charles Hammer, Esq., H.B.M. Consul, Sukum Kale, Black Sea. *Care of J. Murray, Esq., Foreign-office, S. W.*
1860		Dietz, Bernard, Esq., of Algoa Bay. 8, *Dorset-square, W.*
1859		Digby, G. Wingfield, Esq. *Sherborne-castle, Dorset.*

Year of Election.	
1860	Digby, Lieut.-Col. John Almerus. *Chalmington-house, Cattistock, Dorchester.*
1869	Digby, Kenelm T. Esq., M.P. *Shaftesbury-house, Kensington, S.W.*
1859	*Dilke, Sir Charles Wentworth, Bart., M.P. 76, *Sloane-street, S.W.*
1856	Dillon, the Hon. Arthur. 17, *Curzon-street, W.*
1864	590 Dimsdale, J. C., Esq. 50, *Cornhill, E.C.; and* 52, *Cleveland-square, S.W.*
1867	Dix, Thomas, Esq. 10, *Assnell-street, W.C.*
1861	Dixon, Lieut.-Colonel John. 18, *Seymour-street, Portman-square.*
1854	Dixon, W. Hepworth, Esq., F.S.A. 6, *St. James's-terrace, Regent's-park, N.W.*
1857	Dobie, Robert, Esq., M.D., R.N. 7, *Houghton-pl., Ampthill-sq., Hampstead-rd., N.W.*
1854	Dodson, John George, Esq., M.P. 6, *Semmore-place, Mayfair, W.*
1854	Domville, William T., Esq., M.P., R.N. *Army and Navy Club, S.W.; Naval Dockyard, Malta.*
1867	Donald, James, Esq. 20, *Melville-terrace, Edinburgh.*
1858	Donne, John, Esq. *Instow, North Devon.*
1864	Doran, Dr. John, F.S.A. 33, *Lansdowne-road, Notting-hill, W.*
1868	600 Douglas, James A., Esq. 14, *Portchester-square, W.*
1868	Douglas, John, Esq. *Aspen-lodge, Portsea.*
1868	Douglas, Capt. N. D. C. F. *Guards' Club, S.W.*
1850	Dover, John William, Esq. 132, *Stanley-street, Belgravia, S.W.*
1853	Doyle, Sir Francis Hastings C., Bart. *Custom-house, E.C.*
1845	*Draeh, Solomon Moses, Esq. F.G.S.S. 39, *Howland-street, Fitzroy-square, W.*
1869	Drake, Francis, Esq., F.G.S. *Leicester.*
1864	Drew, Major H. 14, *St. James's-square, S.W.*
1869	Drummond, Alfred, Esq. *Charing-cross, S.W.*
1865	Drummond, E. A., Esq. 2, *Bryanston-square, W.*
1846	610 Drummond, Lieut.-General John. *The Boyce, Dymock, Gloucestershire.*
1846	Drury, Capt. Byrne, R.N. *The United Service Club, S.W.*
1851	*Du Cane, Major Francis, R.E. 64, *Lowndes-square, S.W.*
1851	*Dunn, Henry John, Earl, F.R.S. 30, *Prince's-gate, S.W.*
1859	Duckworth, Henry, Esq. *Holmfield-house, Aigburth, near Liverpool.*
1860	*Duff, Right Hon. Mountstuart Elphinstone Grant, M.P. 4, *Queen's-gate-gardens, South Kensington, W.*
1868	Duff, Wm. Pirie, Esq. *Calcutta. Care of Messrs. John Watson, and Co., 34, Finsbury-circus, E.C.*
1857	*Dufferin, Right Hon. Lord, K.P., K.C.B. *Dufferin-lodge, Fitzroy-park, Highgate, N.*
1868	*Dugdale, Captain Henry Charles G. *Mercurie-hall, Atherstone, Warwick.*
1867	*Dugdale, John, Esq. 1, *Hyde-gate-gardens; and Llwyn, Llanfyllin, Oswestry.*
1868	620 Dunbar, John Samuel A., Esq. 28, *Pembridge-crescent, Bayswater, W; and 4, Barnard's Inn, Holborn.*
1853	Duncan, Capt. Francis, R.A., M.A., F.R.S. 32, *The Common, Woolwich, S.E.*
1861	*Duncan, George, Esq. 45, *Gordon-square, W.C.*
1840	*Dundas, Right Hon. Sir David, Q.C. 13, *King's-Bench-walk, Temple, E.C.; and Ochtertyre, Stirling.*

Year of Election

1860 Dunell, Henry James, Esq. 12, *Hyde-park-square, W.*

1859 *Dunlop, R. H. Wallace, Esq., C.B., Indian Civil Service. *Lakefield, Glen Urquhart, Inverness-shire.*

1830 *Dunmore, Charles Adolphus Murray, Earl of. 24, *Carlton-house-terrace, S.W.*

1868 Dunn, Capt. F. J. A. *Portillon, Tours, France, and 4, Cambrian-grove, Gravesend, E.C.*

1837 *Dunraven, Edwin Richard, Earl of, F.R.S. *Adare-manor, Limerick; and Dunraven-castle, Glamorganshire.*

1856 Duprat, Chevalier Alfredo. *H.M.F. 'Arbitrator,' Cape Town, Cape of Good Hope. Care of Jas. Scoresby, Esq., 7, East-India-avenue, E.C.*

1869 630 Durham, Edward, Esq., *Bennobump-house, Kilworth, near Leicester.*

1852 D'Urban, M.-Gen. W. J. *Deputy Quartermaster-General, Canada; U. S. Club, S.W.; and Newport, near Exeter.*

1865 Dutton, F. S., Esq. *Reform Club, S.W.; and Adelaide, Australia.*

1868 Dutton, Frederick H., Esq. 45, *Dover-street, W.*

1867 Eadie, Robert, Esq. *Blaydon-on-Tyne, Durham.*

1854 Eardley-Wilmot, Capt. A. P., R.N., C.B. *Deptford Dockyard, E.*

1856 Eardley-Wilmot, Major-Gen. F., M.R.A. 22, *Victoria-rd., Clapham-common, S.W.*

1857 Eastwick, Captain W. J. 12, *Leinster-terrace, Hyde-park, W.*

1863 Eaton, F. A., Esq. *New University Club, St. James's-street, S.W.*

1862 *Eaton, H., Esq. 16, *Prince's-gate, Hyde-park, W.*

1862 640 *Eaton, Henry William, Esq., M.P. 16, *Prince's-gate, Hyde-park, W.*

1864 *Eaton, William Mecliton, Esq., 16, *Prince's-gate, Hyde-park, W.*

1866 Eatwell, Surgeon-Major W. C. B., M.D. 17, *Kensington-park-terrace, Notting-hill, W.*

1861 Eber, General F. 33, *St. James's-square, S.W.*

1862 Ebury, Lord. 107, *Park-street, Grosvenor-square, W.; and Moor-park, Herts.*

1862 Eden, Vice-Adm. Charles, C.B. 20, *Wilton-place, S.W.*

1858 Edge, Rev. W. J., M.A. *Benenden-vicarage, near Staplehurst, Kent.*

1863 Edgeworth, M. P., Esq., B.C.S., C.S. *Mustrim-house, Anerly, S.*

1867 *Edward, James, Esq. *Bishrahhery, by Dundee, N.B.*

1866 *Edwardes, Thomas Dyer, Esq. 5, *Hyde-park-gate, Kensington, W.*

1858 650 Edwards, Rev. A. T., M.A. 39, *Upper Kennington-lane, S.*

1865 Edwards, G. T., Esq., M.A. *Devon-lodge, Alexandra-road, London, N.W.*

1861 *Edwards, Henry, Esq. 53, *Berkeley-square, W.*

1860 Edwards, Major J. B., R.E. *United Service Club, S.W. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*

1853 Egerton, Captain the Hon. Francis, R.N., M.P. *Bridgewater-house, S.W.; and H.M.S. 'St. George.'*

Year of Election.		
1868		Elder, A. L., Esq. *Carlisle-house, Hampstead.*
1863	*	Elder, George, Esq. *Knock-castle, Ayrshire.*
1867		Eley, Charles John, Esq. *Old Brompton, S.W.*
1865		Eliss, Ney, Jun., Esq. *64, Inverness-terrace, Bayswater, W.*
1845		Ellenborough, Edward, Earl of, G.C.B. *Southam-house, near Cheltenham.*
1863	660	Ellerton, John L., Esq. *6, Connaught-place, Hyde-park, W.*
1860		Elliot, G., Esq., M.P., C.E. *The Hall, Houghton-le-Spring, near Fence Houses, Durham.*
1857	*	Elliot, Capt. L. R. *La Maillerayе-sur-Seine, Seine Inférieure. Care of J. L. Elliot, Esq., 10, Connaught-place, W.*
1830	*	Elliott, Rev. Charles Bolleau, M.A., F.R.S. *Tuttingstone, Suffolk.*
1868		Ellis, C. H. Fairfax, Esq., Lieut. R.A. *Shoeburyness, Essex.*
1865		Ellis, W. E. H., Esq. *Hasfield-rectory, Gloucester; Oriental Club, W.; and Byculla Club, Bombay.*
1858		Elphinstone, Major Howard C., R.E. *Buckingham-palace, S.W.*
1869		Elsey, Colonel William. *West-lodge, Ealing, W.*
1857		Elton, Sir A. H., Bart. *Athenæum Club, S.W.; and Clevedon-court, Somersetshire.*
1868		Ely, John Henry Wellington Graham Loftus, Marquis of. *9, Prince's-gate, W.*
1862	670	* Emanuel, Harry, Esq. *8, Clarence-terrace, Regent's-park, N.W.*
1866		Emanuel, Joel, Esq., F.A.S. *Norfolk-villa, Lonsdowne-road, Notting-hill, W.*
1863		Emslie, John, Esq. *47, Gray's-inn-road, W.C.*
1830		Enderby, Charles, Esq., F.R.S., F.L.S. *15, Great St. Helen's, E.C.*
1860		Enfield, Edward, Esq., F.S.A. *19, Chester-terrace, Regent's-park, N.W.*
1863		Englebeart, Gardner D., Esq. *1, Eaton-place-south, S.W.*
1852		Erskine, Admiral John Elphinstone, M.P., C.B. *H.M.S. 'Edgar;' 1 L, Albany, W.; and Cardross, Stirling, N.B.*
1857	*	Esmonde, G. M. M., Esq. *29, Park-street, Grosvenor-square, W.*
1865		Evans, Colonel William Edwyn. *24, Great Cumberland-place, Hyde-park, W.*
1857		Evans, F. J., Esq., Staff Captain, R.N., F.R.A., F.L.A.S. *4, Wellington-terrace, Charlton, Blackheath, S.E.*
1830	680	* Evans, Vice-Admiral George. *1, New-street, Spring-gardens, S.W.; and Englefield-green, Staines.*
1857		Evans, Thos. Wm., Esq. *1, Dartmouth-street, Westminster, S.W.; and Allestree-hall, Derby.*
1830	*	Evans, W. Esq.
1867		Evans, W. Herbert, Esq. *32, Hertford-street, Mayfair, W.*
1861		Evelyn, Lieut.-Colonel George P. *34, Onslow-gardens, Brompton, S.W.*
1851	*	Evelyn, William J., Esq., F.S.A. *Evelyn Estate-office, Evelyn-street, Deptford.*
1830	*	Everett, James, Esq., F.S.A.
1865		Everitt, George A., Esq. *Knowle-hall, Warwickshire.*
1856		Ewing, J. D. Crum, Esq. *21, Birchin-lane, E.C.*
1869		Ewing, John Orr, Esq. *Levenfield-house, Alexandria, Dumbartonshire.*
1857	690	Eyre, Edward J., Esq.
1861		Eyre, George E., Esq. *59, Lowndes-square, Brompton, S.W.*

Year of Election	
1856	Eyre, Major-Gen. Sir Vincent, C.B. *Athenæum Club, S.W.; and* 53, *Thurloe-square, S.W.*
1861	Fairbairn, Sir William, Bart., C.E., F.R.S. *Manchester.*
1869	Fairfax, Captain Henry, R.N. *Army and Navy Club, S.W.*
1856	Fairholme, George Knight, Esq.
1866	Fairman, Edward St. John, Esq., F.G.S., &c. 874, *Via Santa Maria, Pisa. Care of H. Fairman, Esq.*
1838	Falconer, Thomas, Esq. *Usk, Monmouthshire.*
1868	Falconer, William, Esq. 23, *Leadenhall-street, E.C.; and* 42, *Hillsborough-road, Camden new town, N.*
1857	Falkland, Lucius Bentinck, Viscount. *Shutterhelfe, Yorkshire.*
1855	700 *Fanshawe, Admiral E. G. 63, *Eaton-square, S.W.*
1868	Farquharson, Lieut.-Col. G, M.B. *Junior United Service Club, S.W.*
1863	*Farrer, W. Jas., Esq. 24, *Bolton-street, Piccadilly, W.*
1864	Faulkner, Charles, Esq., F.L.S., F.G.S. *Derlington, Oxon.*
1863	*Faunthorpe, Rev. J. P., M.A. *Training-College, Battersea.*
1869	Fawcett, Captain Edward Boyd, M.A. *Dunolly, Torquay.*
1869	Fawcett, Henry Esq. *Wainsford, Lymington.*
1853	*Fayrer, Joseph, Esq., M.D. *Calcutta. Care of General Spens,* 14, *Drummond-place, Edinburgh.*
1858	Fazakerley, J. N., Esq. 17, *Montagu-street, Portman-square, W.*
1868	Felkin, Wm., Esq., Jun., F.L.S. *Beeston, near Nottingham.*
1864	710 Fergusson, J., Esq. 6, *Gloucester-square, Hyde-park.*
1840	*Fergusson, James, Esq., F.R.S. 20, *Langham-place, W.*
1865	Ferreira, Baron De. 12, *Gloucester-Place, Portman-square, W.*
1860	Ferro, Don Ramon de Silva.
1865	Field, Hamilton, Esq. *Thornton-road, Clapham-park.*
1844	Findlay, Alex. George, Esq. 55, *Fleet-street, E.C.; and Dulwich-wood-park, S.*
1862	Finnis, Thomas Quested, Esq., Alderman. *Woodford, Essex, N.E.*
1863	Fisher, John, Esq. 60, *St. James's-street, S.W.*
1869	Fitch, Frederick, Esq., F.R.H.S. *Hadleigh-house, Highbury-new-park, N.*
1857	*Fitzclarence, Commander the Hon. George, R.N.
1853	720 Fitzgerald, J. F. V., Esq. 11, *Chester-square, S.W.*
1861	Fitzgerald, Captain Keane. 2, *Portland-place, W.*
1864	Fitz-Patrick, Lieut. Francis Skelton, 42nd Regt. Madras Army.
1857	Fitzwilliam, the Hon. C. W., M.P. *Brooks' Club, St. James's-street, S.W.*
1837	*Fitzwilliam, William Thomas, Earl. 4, *Grosvenor-square, W.; and Wentworth-house, Rotherham, Yorkshire.*
1855	*Fitzwilliam, Wm. S. Esq. 28, *Ovington-square, Brompton, S.W.*
1863	Fleming, G., Esq. *Brompton Barracks, Chatham.*
1861	*Fleming, John, Esq. 18, *Leadenhall-street, E.C.*
1865	Fleming, Rev. T. S. *Roscoe-place, Chapeltown-road, Leeds.*
1853	*Flemyng, Rev. Francis P.

Year of Election.		
1862	730	Fletcher, John Charles, Esq. *Dale-park, Arundel; and Eaton-place, S.W.*
1858		Fletcher, John Thompson, Esq. 15, *Upper Hamilton-terrace, St. John's-wood, N.W.*
1857		Fletcher, Thomas Keddey, Esq. *Union-dock, Limehouse, E.*
1866		Flood, John Edwin, Esq. 126, *High-street, Poplar, E.*
1864		Flower, Capt. L. *Bonstead, Surrey; and Queen's United Service Club, S.W.*
1865		Foley, Col. the Hon. St. George, C.B. 24, *Bolton-street, W.*
1861		Foord, John Bromley, Esq. 52, *Old Broad-street, E.C.*
1860		Forbes, Commander Charles S., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*
1863		Forbes, Capt. C. J. F. Smith. 5, *Hatch-street, Dublin.*
1867		Forbes, Geo. Edward, Esq. *Union Club, S.W.; 11, Melville-street, Edinburgh; New Club, Edinburgh.*
1860	740	Forbes, Lord, M.A. *Castle Forbes, Aberdeenshire.*
1869		Ford, Col. Bernett, Governor of the Andaman Islands. 24, *Upper-park-road, Hampstead.*
1868		Forster, Hon. Anthony. *Newham-grange, Winston, Darlington, Durham.*
1843		Forster, Rev. Charles, B.D. *Stisted-rectory, Essex.*
1839		*Forster, William Edward, Esq. *Burley, near Otley.*
1867		Forsyth, T. Douglas, Esq., C.B. (U.C.S.), Commissioner, Jullundhur, Punjab. *Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
1861		Forsyth, William, Esq., M.P., Q.C. 61, *Rutland-gate, S.W.*
1858		Fortescue, Right Hon. Chichester S., M.P. 7, *Carlton-gardens, S.W.*
1861		*Fortescue, Hon. Dudley F., M.P. 9, *Hertford-street, Mayfair W.*
1869		Foster, Ebenezer, Esq. 19, *St. James's-place, St. James's, S.W.*
1866	750	Foster, Edmund, Esq., Jun. 79, *Portsdown-road, Maida-vale, W.*
1864		Foster, H. J., Esq.
1864		Foster, Capt. W. J. *Stubingdon-house, Fareham, Hants.*
1863		*Fowler, J. T., Esq. *Government Inspector of Schools, Adyar, Madras, India. Care of Rev. A. Wilson, National Society's Office, Sanctuary, Westminster.*
1850		*Fowler, Robert N., Esq., M.P., B.A. 50, *Cornhill, E.C.; and Tottenham, N.*
1859		Fox, Lieut.-Colonel A. Lane. 10, *Upper Phillimore-gardens, Kensington, W.*
1830		*Fox, Lieut.-General C. R. *Travellers' Club, S.W.; and 1, Addison-road, Kensington, W.*
1866		Fox, D. M., Esq., Chief Engineer of the Santos and St. Paulo Railway. *St. Paulo, Brazil.*
1864		*Fox, F. E. Esq., B.A. *Elmsleu, Tottenham, Middlesex.*
1865		Fox, Samuel Crane, Esq. *Longmoor-villa, Romford-road, E.*
1865	760	*Franks, Aug. W., Esq. 103, *Victoria-street, S.W.*
1860		Franks, Charles W., Esq. *Local Government Act Office, 8, Richmond-terrace, Whitehall.*
1867		Fraser, Edward John, Esq. (Solicitor). 1, *Percy-villas, Camden-hill, Kensington, W.*
1862		Fraser, Capt. H. A., I.N.

Year of Election		
1860		Fraser, Thos., Esq.
1866		Fraser, Capt. T. *Otago, New Zealand.*
1858		Frater, Alexander, Esq. *Canton. Care of Thomas Frater, Esq., National Provincial Bank of England, Brecon, Wales.*
1869		Freke, Thomas George, Esq. 1, *Cromwell-houses, Kensington, W.*
1860		Freeman, Daniel Alex., Esq., Barrister-at-law. *Plowden-buildings, Temple, E.C.*
1868		Freeman, Henry W., Esq. *Junior Athenæum Club, S.W.*
1864	770	Fremantle, Lieut.-Col. Arthur. *Guards' Club, S.W.*
1863		Fremantle, Captain Edmund Robert, R.N. 4, *Upper Eccleston-street, S.W.*
1856		Fremantle, Rt. Hon. Sir Thomas F., Bart. 4, *Upper Eccleston-street, Belgrave-square, S.W.*
1864		Freme, Major James H. *Wrentnall-house, Shropshire; and Army and Navy Club, S.W.*
1850		Frere, Bartle John Laurie, Esq. 45, *Bedford-square, W.C.*
1839		*Frere, George, Esq. *Cape of Good Hope. Care of the Foreign Office, S.W.*
1867		Frere, Sir Hy. Bartle Edw., K.C.B., G.C. Star of India. 44, *Prince's-gardens, W.*
1842		Frere, William Edw., Esq., F.R.A.S. *The Rectory, Bitton, Gloucestershire.*
1859		Fryer, William, Esq. 39, *Marlborough-hill-gardens, St. John's-wood, N.W.*
1863		Fuidge, William, Esq. 5, *Park-row, Bristol.*
1860	780	Fussell, Rev. J. G. Curry. 16, *Cadogan-place, S.W.*
1868		Fyfe, Andrew, Esq., M.D. 112, *Brompton-road, S.W.*
1851		Fynes Clinton, Rev. Charles J., M.A. 3, *Montagu-place, Russell-square, W.C.; and Cromwell, Notts.*
1866		Fytche, Colonel Albert. *Reform Club, S.W.*
1863		*Gabrielli, Antoine, Esq. 6, *Queen's-gate-terrace, Kensington, W.*
1858		Galsford, Thomas, Esq. *Travellers' Club, S.W.*
1861		Gallagher, John, Esq., M.D. *Reform Club, S.W.; and 109, Westbourne-terrace, W.*
1853		*Galloway, John James, Esq.
1869		Galsworthy, Frederick Thomas, Esq. 8, *Queen's-gate, Hyde-park, W.*
1848		*Galton, Capt. Douglas, R.E. 12, *Chester-street, Grosvenor-place, S.W.*
1850	790	*Galton, Francis, Esq., M.A., F.R.S. 42, *Rutland-gate, S.W.; and 5, Berkeley-terrace, Leamington.*
1854		*Gammell, Major Andrew. *Drumtochty, Kincardineshire, N.B.*
1861		Gardan, Robert Jones, Esq. 30, *Cathcart-road, South Kensington, S.W.*
1869		Gardner, Christopher, T. Esq. 3, *St. James's-terrace, Paddington, W.*
1865		Gardner, Capt., G. H., R.N. 7, *James-street, Westbourne-terrace, W.*
1866		Gardner, John Dunn, Esq. 19, *Park-street, Park-lane, W.*
1863		Gascoigne, Frederic, Esq. *Parlington, Yorkshire.*

Year of Election.		
1859		*Gamlot, John P., Jun., Esq. *6, Sussex-place, Regent's-park, N.W.*
1866		Gastrell, Lieut.-Col. James E. (B. Staff Corps). *Surveyor-General's Office, Calcutta. Care of H. T. Gastrell, Esq., 56, Lincoln's-inn-fields, W.C.*
1866		*Gatty, Charles H., Esq., M.A., *Felbridge-park, East Grinstead, Sussex.*
1865	800	George, Rev. H. B. *New College, Oxford.*
1859		Gerstenberg, Isidore, Esq. *Stockley-house, North-gate, Regent's-park, N.W.*
1866		*Gibb, George Henderson, Esq., 13, *Victoria-street, Westminster, S.W.*
1865		*Gibbons, Sills John, Esq., Alderman. 13, *Upper Bedford-place, Russell-square, W.C.*
1859		*Gibbs, H. Hucks, Esq. *St. Dunstan's, Regent's-park, N.W.*
1855		Gibraltar, Right Rev. and Hon. C. A. Harris, Bishop of. *Gibraltar Palace, Malta.*
1866		Gibson, John, Esq. *2, Piccadilly, Bradford, Yorkshire; and British Consulate, Hankow, China.*
1855		Gillespie, Alexander, Esq. *Heathfield, Walton-on-Thames, Surrey.*
1866		*Gillespie, William, Esq. (*of Torbane-hill*). 46, *Melville-street, Edinburgh.*
1857		Gillespy, Thomas, Esq. *Brabant-court, Philpot-lane, E.C.*
1868	810	*Gillett, Alfred, Esq. 113, *Piccadilly, W.; and Banbury, Oxon.*
1863		*Gillett, William, Esq. *6Z, Albany, W.*
1861		Gilliat, Alfred, Esq. *Exton-house, Bishop's Waltham, Hants.*
1868		Gilliat, Algernon, Esq. *Fernhill, near Windsor; and 7, Norfolk-crescent, W.*
1863		Gillies, Robert, Esq., C.E. *Dunedin, Otago, New Zealand.*
1867		Gisborne, Fred. N., Esq., Engineer and Electrician. 445, *West Strand, W.C.*
1856		Gladdish, Col. William. *Bycliffe, Gravesend.*
1864		Gladstone, George, Esq. *Clapham-common, S.*
1865		Gladstone, J. H., Esq., Ph.D. 17, *Pembridge-square, W.*
1862		*Gladstone, Robert Stuart, Esq.
1846	820	*Gladstone, William, Esq. 57½, *Old Broad-street, E.C.*
1864		*Gladstone, W. K., Esq. 38a, *Old Bond-street, W.; and Fitzroy-park, Highgate, N.*
1860		Glascott, Commander Adam Gifford, R.N., Acting Commissioner on the Turko-Persian Frontier. *Messrs. Chard, 3, Clifford's Inn, Fleet-street, E.C.*
1867		Glass, H. A., Esq. 4, *Gray's-inn-square, W.C.*
1857		Gleig, Rev. G. R., M.A. *Chaplain-General, Chelsea-hospital, S.W.*
1854		Glen, Joseph, Esq., Mem. Geogr. Soc. of Bombay. *Oriental Club, W.*
1857		Glover, Commr. John H., R.N. *Lagos; and Army and Navy Club, S.W.*
1866		Glover, Robert Reaveley, Esq. 30, *Great St. Helen's, E.C.*
1858		Glyn, Richard H., Esq. 10, *King's-arms-yard, E.C.; and Oriental Club, S.W.*
1864		Glyn, Sir Richard George, Bart. *Army and Navy Club, S.W.*
1862	830	Goddard, James, Jun., Esq. 14, *Mincing-lane, E.C.*
1869		Goldney, G. Esq., M.P. 40, *Hill-street, Berkeley-square, W.*
1868		Goldsmid, Sir Francis, Bart., M.P. *Inner-circle, Regent's-park, N.W.*

Year of Election		
1863		Goldsmid, Lt.-Colonel Frederick John. *Harrow-on-the-hill; Southborough, Kent; and United Service Club, S.W.*
1851		Goldsmid, Julian, Esq. 49, *Grosvenor-street, S.W.*
1868		Goldsworthy, Major W. T. *British Service Club, 4, Park-place, St. James's, S.W.*
1860		Gooch, Thomas Longridge, Esq. *Team-lodge, Saltwell, Gateshead-on-Tyne.*
1864		Goodall, George, Esq. *Messrs. Cox and Co., Craig's-court; and Junior Carlton Club, W.*
1867		*Goodenough, Fred. Addington, Esq. *Care of F. Jennings, Esq., 24, Cannon-street, E.C.*
1863		*Goodenough, Capt. J. G., R.N. *U. S. Club, S.W. Care of Messrs. Stilwell, 22, Arundel-street, Strand, W.C.*
1864	842	*Goodenough, Lieut.-Col., R.A. *F Battery, 9th Brigade, Royal Artillery, Ahmedabad, Bombay. Care of Messrs. Cox and Co., Craig's-court, S.W.*
1861		Gooldin, Joseph, Esq. 18, *Lancaster-gate, W.*
1865		*Goolden, Charles, Esq. *United University Club, S.W.*
1856		*Gordon, Colonel the Hon. Alexander H., C.B.
1854		Gordon, Harry George, Esq. 1, *Clifton-place, Hyde-park-gardens, W.; and Killiechassi, Dunkeld, Perthshire.*
1856		Gordon, Admiral the Honourable John. 28, *Queen Anne-street, W.*
1853		Gordon, Vice-Admiral Robert. *United Service Club, S.W.*
1856		Gore, Augustus F., Esq., Colonial Secretary. *Barbadoes.*
1853		Gore, Richard Thomas, Esq. 6, *Queen-square, Bath.*
1859		Gosling, Fred. Solly, Esq. 18, *New-street, Spring-gardens, S.W.*
1862	850	Goss, Samuel Day, Esq., M.D. 111, *Kensington-park-road, S.*
1868		Gough, Hugh, Viscount, F.L.S. *Lough Cutra Castle, Gort, Co. Galway.*
1855		Gould, Lieut.-Colonel Francis A. *Boatingford, Herts.*
1848		Gould, John, Esq., F.R.S., F.L.S. 26, *Charlotte-street, Bedford-square, W.C.*
1863		Gowen, Colonel J. E.
1867		Grabham, Michael, Esq., M.D. *Madeira. Care of C. R. Blandy, Esq., 26, Crutched-friars, E.C.*
1868		Greene, H. M. S., Esq. *Junior Athenæum; and East India U. S. Club, S.W.*
1869		Graham, Andrew, Esq., Staff Surg., R.N. *Army and Navy Club, S.W.*
1868		Graham, Cyril C., Esq. 9, *Cleveland-row, St. James's, S.W.; and Debroe-house, Watford, Herts.*
1868		*Graham, Thomas Cunninghame, Esq. *Carlton Club, S.W; and Dunlop-house, Ayrshire.*
1861	860	Grant, Alexander, Esq. *Oakfield-house, Hornsey, N.*
1861		Grant, Daniel, Esq. 11, *Warwick-road, Upper Clapton, E.*
1865		*Grant, Francis W., Esq. *Army and Navy Club, S.W.*
1860		Grant, Lieut.-Col. James A., C.B., C.S.I. *E. India U. S. Club, S.W.; and 7, Park-square, Regent's-park, N.W.*
1862		Grant, Lieut. J. M. (late 25th Reg.) *Elands Fort, Cape of Good Hope. Care of Messrs. Bidgood and Sons, 2, Waterloo-place, S.W.*

Year of Election.	
1860	Grantham, Capt. James, R.E. *Royal Engineers' Office, Sheerness.*
1867	Graves, Rev. John. *Underbarrow Parsonage, Milnthorpe, Westmoreland.*
1830	*Gray, John Edw., Esq., PH. DR., F.R.S., Z.S. and L.S. *British Museum, W.C.*
1868	Gray, Lieut.-Col. William, R.F. 26, *Prince's-gardens, W.; and Darcy Lever-hall, near Bolton.*
1862	Greathed, Lieut.-Colonel Wilberforce, W. H., C.B.
1863	870 Greaves, Rev. Richard W. 1, *Whitehall-gardens, W.*
1861	Green, Capt. Francis. 89, *Eccleston-square, S.W.*
1869	Green, Sir W. H. R., K.C.S.I., C.B. 36, *St. George's-road, Eccleston-square, S.W.*
1830	Greene, Thomas, Esq. *Whittington-hall, near Burton, Westmoreland.*
1857	*Greenfield, W. B., Esq. 59, *Porchester-terrace, Hyde-park, W.; and Union Club, S.W.*
1865	Greg, W. R., Esq., Comptroller of H.M.S. Stationery Office. *Wimbledon, S.W.*
1858	*Gregory, Augustus Charles, Esq. *Surveyor-General, Brisbane, Queensland, Australia.*
1838	Gregory, Charles Hutton, Esq., C.E. 1, *Delahay-street, Westminster, S.W.*
1860	*Gregory, Francis Thomas, Esq. *Queensland.*
1858	*Gregory, Isaac, Esq. *Charlton-hall, Victoria-park, Manchester.*
1857	820 *Grellet, Henry Robert, Esq.
1865	Grenfell, Henry R., Esq., M.P. 15, *St. James's-place, S.W.*
1858	Grenfell, Pascoe St. Leger, Esq. *Maesteg-house, Swansea.*
1853	Grenfell, Riversdale W., Esq. 27, *Upper Thomas-street, E.C.*
1830	*Greswell, Rev. Richard, M.A., F.R.S. 39, *St. Giles, Oxford.*
1868	Grey, Charles, Esq. 13, *Carlton-house-terrace, S.W.*
1837	*Grey, Sir George, K.C.B. *Colonial Office; and Grosvenor-mansions, S.W.*
1864	Grierson, Charles, Esq. *Alexandria. Care of Rev. W. Grierson Smith, Ashkirk-by-Hawick, Scotland.*
1868	Griffin, Daniel, Esq. 3, *Crescent-place, Clapham-common, S.*
1862	Griffin, James, Esq. 2, *Eastern-parade, Southsea; and The Hard, Portsea, Hants.*
1861	890 *Griffith, Daniel Clewin, Esq. 20, *Gower-street, W.C.*
1859	Griffith, John, Esq. 16, *Finsbury-place-south, E.C.*
1853	Griffith, Sir Richard. 20, *Eccleston-square, S.W.*
1836	Griffith, Richard Clewin, Esq. 20, *Gower-street, W.C.*
1867	Griffiths, Captain A. G. F., 83rd Reg. (Major of Brigade, Gibraltar). *Care of E. S. Cobb, Esq., 35, Craven-street, Strand, W.C.*
1869	Griffiths, William, Esq., J.P. 24, *Great Cumberland-place, W.; and The Welkin, Lindfield, Sussex.*
1855	Grindrod, R. B., Esq., M.D., LL.D., F.L.S., &c. *Tuxwood-house, Malvern.*
1861	Grosvenor, Lord Richard, M.P. 53, *Upper Grosvenor-street, W.*
1858	Grote, George, Esq. 12, *Savile-row, W.*
1857	Grumisson, Charles Lewis, Esq. 10, *Surrey-street, Strand, W.C.*

Year of Election		
1861	900	Gunnell, Commander Edmund H., R.N. *Army and Navy Club, S.W.; 21, Argyll-road, Campden-hill, W.*
1859		*Gurney, John H., Esq. *Marldon, Totnes.*
1857		Gurney, Samuel, Esq. 20, *Hanover-terrace, Regent's-park, W.*
1862		Guthrie, James Alexander, Esq. 30, *Portland-place, W.*
1865		Gwyther, John H., Esq. *Meadowcroft, Lower Sydenham.*
1863		Hadfield, Wm., Esq. 11, *Inverness-road, W.*
1865		Hadley, Henry, Esq., M.D. *Needwood-lodge, Bay's-hill, Cheltenham.*
1863		Hales, P. D., Esq. *Sudbury-priory, Middlesex.*
1865		Halcombe, Rev. J. J. *Charter-house, E.C.*
1868		Hale, Rev. Edward, M.A. *Eton College; and United University Club, S.W.*
1865	910	Hale, Warren S., Esq., Alderman. 71, *Queen-street, Cheapside, E.C.*
1860		Halliday, Lieut.-Colonel William Robert. *United Service Club, S.W.*
1853		Halifax, Viscount, G.C.B. 10, *Belgrave-square, S.W.; and Hickleton, Yorkshire.*
1853		*Hallett, Rev. Dunbar S. *Little Bookham, Surrey.*
1853		*Hallett, Lieut. Peter A., R.N.
1861		Hall, Charles Hall, Esq. *Watergate-house, Exmouth.*
1863		Hall, Henry, Esq. 109, *Victoria-street, S.W.*
1862		Hall, James Felbutt, Esq. *Fore-street, Limehouse, E.*
1863		Hall, Thomas F., Esq., F.C.S. 29, *Warwick-square, S.W.*
1853		Hall, Admiral Sir William Hutcheson, K.C.B., F.R.A. *United Service Club, S.W.; and 48, Phillimore-gardens, Kensington, W.*
1865	920	Hallett, Lieut. Francis C. H., R.H.A. *Junior United Service Club, S.W.*
1858		Halloran, Arthur B., Esq. 3, *Albert-terrace, St. Leonard's, Exeter.*
1862		Hamilton, Archibald, Esq. *South Barrow, Bromley, Kent, S.E.*
1866		Hamilton, Rear-Admiral C. Baillie. 30, *Warwick-square, S.W.*
1861		Hamilton, Lord Claude, M.P. 19, *Eaton-square, S.W.; and Barons-court, County Tyrone.*
1830		*Hamilton, Capt. Henry G., R.N. 71, *Eccleston-square, S.W.*
1859		Hamilton, Capt. Richard Vesey, R.N. 30, *Victoria-road, Charlton, S.E.*
1861		Hamilton, Col. Robert William, Grenadier Guards. 18, *Eccleston-square, S.W.*
1865		Hamilton, R., Esq. *Care of J. Forster Hamilton, Esq., 32, New Broad-street, E.C.*
1850		Hamilton, Tarrick, Esq. 121, *Park-street, Grosvenor-square, W.*
1846	930	Hamilton, Rear-Admiral W. A. Baillie. *Macartney-house, Blackheath, S.E.*
1853		*Hand, Admiral George S., R.N., C.B. *United Service Club, S.W.: and H.M.S. 'Victory.'*

Year of Election		
1860		*Handley, Benjamin, Esq. *Chandos-road, Stratford; and Grafton Club, Grafton-street, W.*
1860		Hanham, Commr. T. B., R.N. *Moreton-house, near Blandford, Dorset.*
1861		*Hankey, Blake Alexander, Esq.
1857		Hankey, Thomson, Esq. 45, *Portland-place, W.*
1837		*Hanmer, Sir J., Bart., M.P., F.R.S. *Hanmer-hall and Bettisfield-park, Flintshire.*
1859		*Hansard, Henry, Esq. 13, *Great Queen-street, W.C.*
1840		*Harcourt, Egerton V., Esq. *Whitwell-hall, York.*
1864		*Hardie, Gavin, Esq. 113, *Piccadilly, W.*
1864		Harding, Captain Charles, F.R.S.L., F.S.A., F.A.S.L. *Grafton Club, 10, Grafton-street, Piccadilly, W.*
1864	940	Harding, J. J., Esq. 1, *Barnsbury-park, Islington, N.*
1864		Hardinge, Capt. E., R.N. 32, *Hyde-park-square, W.*
1861		Hardinge, Henry, Esq., M.D. 18, *Grafton-street, Bond-street, W.*
1852		Hardman, William, Esq., M.A. *Norbiton-hall, Kingston-on-Thames.*
1864		Hardwick, B. Esq. 157, *Fenchurch-street, E.C.*
1868		Harper, J. A. W., Esq. 23, *Grosvenor-road, Pimlico, S.W.; and Lloyd's, E.C.*
1855		Harris, Admiral the Hon. E. A. J., C.B. *H.B.M.'s Envoy Extraordinary and Minister Plenipotentiary, Legation Britannique, Berne. Messrs. Woodhead.*
1869		Harris, Lieut. G. F., 20th Regiment. *Care of Colonel Harris, 28, Leinster-road, Dublin.*
1859		Harris, Capt. Henry, H.C.S. 55, *Gloucester-terrace, Hyde-park, W.*
1865		Harris, John M., Esq. 12, *Holland-terrace, Holland-road, Kensington, W.*
1863	950	Harrison, Chas., Esq. *Lawrie-park, Sydenham; and 3, Great Tower-st., E.C.*
1863		*Harrison, William, Esq., F.S.A., F.G.S., &c. *Conservative Club, S.W.; Royal Thames Yacht Club, 7, Albemarle-street, W.; and Stonyhurst-hall, near Preston, Lancashire.*
1838		Harrowby, Dudley, Earl of. *Sandon-ho., Lichfield; and Norton, Gloucestershire.*
1866		*Hart, J. L., Esq. 20, *Pembridge-square, W.*
1854		*Hartland, F. Dunn, Esq., F.S.A., &c. 14, *Chesham-place, S.W.; and the Oaklands, near Cheltenham.*
1863		Harvey, Charles, Esq. *Bathgar-cottage, Streatham, S.*
1865		Harvey, C. H., Esq., M.D. 17, *Whitehall-place, S.W.*
1865		Harvey, Edward H. Esq. *Hill-grove house, Bembridge, Isle of Wight; and Carlton Club, S.W.*
1867		Harvey, James, Esq. (Solicitor). *Exchange-street, Inveraargill, Southland, New Zealand. Care of the Bank of Otago, Old Broad-street, E.C.*
1864		Harvey, John, Esq. *Ickwell Bury, Biggleswade.*
1864	960	Harvey, John, Esq. 7, *Mincing-lane, E.C.*
1865		Harvey, Richard M., Esq. 15, *Portman-street, W.*
1864		Harvey, W. D., Esq. 57, *Notting-hill-square, S.W.*
1858		Hawker, Edward J., Esq. 37, *Cadogan-place, S.W.*

Year of Election.	
1834	Hawkins, Francis Bisset, Esq., M.D., F.R.S. 29, *Upper Harley-street, W.*; and *Lovell-lodge, Dorchester.*
1857	Hawkins, Capt. Frank K., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*
1840	*Hawkins, John, Esq.
1858	*Hawkins, Col. J. Summerfield, R.E. *Woolwich, S.E.*
1861	Hawksley, Thomas, Esq., C.E. 14, *Phillimore-gardens, Kensington, S.W.*
1860	Haworth, Frederick, Esq.
1852	97*Hay, Rear-Admiral Sir J. C. Dalrymple, Bart., M.P., F.R.S. 109, *St. George's-square, S.W.*; *U. S. Club, S.W.*; *Dunsaglt, Glenluce*; and *Harrow-on-the-Hill, N.W.*
1863	*Hay, Lord John, M.P. 15, *Cromwell-road, South Kensington, W.*
1835	Hay, Lord William. 2, *Clement-row, S.W.*
1859	Hay, Major W. E. 7, *Westminster-chambers, Victoria-road, S.W.*; and *Garrick Club, Garrick-street, W.C.*
1858	Haymann, David, Esq. *Partway-house, Weston, Bath.*
1864	Haymann, James, Esq. *Burdett-house, Burdett-road, E.*
1862	Head, Alfred, Esq. 13, *Craven-hill-gardens, Bayswater, W.*
1863	Headlam, Right Hon. Thomas E., M.P. 27, *Ashley-place, Victoria-street, S.W.*
1856	Heath, J. Benj., Esq., F.R.S., F.S.A., Consul for Sardinia. 31, *Old Jewry, E.C.*
1863	Heathfield, W. E., Esq. 20, *King-street, St. James's, S.W.*
1861	98*Hector, Alexander, Esq. 6, *Stanley-gardens, Bayswater, W.*
1861	Hector, James, Esq., M.D. *Care of E. Stanford, Esq.*
1862	Hemans, Geo. Willoughby, Esq., C.E. *Westminster-chambers, Victoria-street, S.W.*
1837	*Henderson, James, Esq. *Littlewood-park, Forfar, Aberdeenshire.*
1853	Henderson, John, Esq. 2, *Arlington-street, Piccadilly, W.*
1866	Henderson, Patrick, Esq. *Care of George Reid, Esq.*, 21, *Abchurch-lane, E.C.*
1864	Henderson, R., Esq. 7, *Mincing-lane, E.C.*
1852	Henderson, William, Esq. 5, *Stanhope-street, Hyde-park-gardens, W.*
1844	*Heneage, Edward, Esq. *Staf's-end, Hemel Hempstead.*
1861	Henn, Rev. J., B.A., Head Master of the Manchester Commercial Schools. *Old Trafford, Manchester.*
1860	99*Hennessy, J. B. N., Esq. 1st *Asst. Trig. Survey of India, Delara in the Dhoon, N.W. Provinces, India. Care of Messrs. H. S. King and Co.*
1838	*Henry, Wm. Chas., Esq., M.D., F.R.S. *Hatfield, near Ledbury, Herefordshire.*
1861	*Henty, Douglas, Esq. *Chichester.*
1857	Herd, Captain D. J. 2, *Norway-house, Limehouse, E.*
1858	Hertslet, Edward, Esq. *Librarian, Foreign Office, S.W.*: and *Belle-vue-house, Richmond, S.W.*
1841	Heurey, James Augustus, Esq. *Manningford Bruce, Pewsey, Wilts.*
1861	Heugh, John, Esq. *Tunbridge-wells.*

Year of Election	
1840	*Heywood, James, Esq., F.R.S. *Athenæum Club, S.W.; and 26, Kensington-palace-gardens, W.*
1860	Heyworth, Capt. Lawrence, 4th Royal Lancashire. *Junior United Service Club, S.W.*
1853	Hickey, Edwin A., Esq. 116, *Piccadilly, W.*
1867	1000Higgins, Edmund Thomas, Esq., M.R.C.S. 122, *King Henry's-road, Haverstock-hill, N.*
1868	Hiley, Rev. W., M.A. 3, *Cambridge-gardens, Richmond-hill, S.W.*
1856	Hill, Arthur Bowdler, Esq. *South-road, Clapham-park, Surrey, S.*
1867	Hill, O'Dell Travers, Esq. 1, *Lansdowne-villas, Bridge-road West, Battersea, S.W.*
1854	Hill, Lieut.-Colonel Stephen J., Governor of Antigua.* *Army and Navy Club, S.W. Care of Capt. E. Barnett, R.N., 14, Woburn-square, W.*
1861	Hilliard, Major George Towers, Madras Staff Corps. 11, *Lansdowne-road, Kensington-park, Notting-hill, W.*
1858	Hinchliff, T. Woodiwiss, Esq., Barrister-at-Law. 64, *Lincoln's-inn-fields, W.C.*
1869	*Hinde, Samuel Henry, Esq. *Windham Club, S.W.*
1846	*Hindmarsh, Frederick, Esq. 4, *New-inn, Strand, W.C.*
1861	Hoare, Denis John, Esq. *Royal Thames Yacht Club, Albemarle-street, W.*
1868	1010Hoare, Samuel, Esq., M.A. 1, *Upper Hyde-park-street, W.*
1868	Hobson, Stephen James, Esq. 32, *Nicholas-lane, Lombard-street; and* 10, *Regent's-park-road, N.W.*
1855	Hobbs, Wm. Geo. Ed., Esq. *Beulah-cottage, London-road, Enfield, N.*
1850	*Hobhouse, Henry William, Esq. 24, *Cadogan-place, S.W.*
1869	Hodges, Henry, Esq. *Grammar-school, Cricklewood, near Kilburn.*
1850	*Hodgson, Arthur, Esq., Superintendent of the Australian Agricultural Company.
1861	*Hodgson, James Stewart, Esq. 8, *Bishopsgate-street, E.C.*
1857	Hodgson, Kirkman Daniel, Esq. 8, *Bishopsgate-street, E.C.*
1869	Hodgson, William H., Esq. *Treasury-chambers; and* 1, *Whitehall-gardens, S.W.*
1856	Hogg, James, Esq. 217, *Piccadilly, W.*
1868	1020Holdich, Thos. Hungerford, Esq., Lt. R.E. 22, *Norland-square, Notting-hill, W.; and* 4, *New-street, Spring-gardens, S.W.*
1865	Hole, Charles, Esq. *Loughborough-house-school, East Brixton, S.*
1839	*Holford, Robert S., Esq. *Dorchester-house, Park-lane, W.*
1867	Holland, Rev. Fred. Whitmore. 6, *Fortune-place, Connaught-square, W.*
1830	Holland, Sir Henry, Bart., M.D., F.R.S. '25, *Lower Brook-street, W.*
1861	Holland, Colonel James. *Southside, The Park, Upper Norwood, S.E.*
1863	Holland, Luton, Esq. 6, *Queen's-villas, Windsor.*
1862	Holland, Robert, Esq. *Stanmore-hall, Great Stanmore, Middlesex.*
1868	Holland, Major T. J., C.B. *Topo. Dept. War-office; The Park, Upper Norwood; East India U.S. Club; and Club of Western India, Poona.*
1861	*Hollingsworth, John, Esq., M.R.C.S. *Maid-nature-house, Greenwich, S.E.*
1861	1030Holme, J. Wilmn, Esq., M.A. *Dunmowood, Beckenham, Kent, S.E.*
1835	*Holmes, James, Esq. 4, *New Ormond-street, Queen-square, W.C.*

Year of Election.

1839 *Holroyd, Arthur Todd, Esq., M.D., F.L.S. *Master's-office, Sydney, New South Wales. Care of Edgar Howell, Esq., 3, St. Paul's-churchyard, E.C.*

1857 Holroyd, Henry, Esq. Barrister-at-Law. *2, Elm-court, Temple, E.C.*

1867 *Holstein, The Marquis de Souza. *Lisbon. Care of Messrs. Kremitzer and Micville, 12, Angel-Court, E.C.*

1869 Holt, George, Esq. *Union-street, Willenhall.*

1864 Holt, Yeoey, Esq. 17, *Whitehall-place, S.W.*

1857 Homfray, William Henry, Esq. 6, *Storey's-gate, S.W.*

1865 Honywood, Robert, Esq. *Manor-house, Wethersfield, Braintree: Windham Club, S.W.*

1864 *Hood, Sir Alex. Acland, Bart. *St. Audrie's-park, Bridgwater, Somerset.*

1862 1042Hood, Henry Schiebach, Esq. *War Office, S.W.; and 10, Kensington-park-gardens, W.*

1861 Hood, T. H. Cockburn, Esq. *Stoneridge, Berkshire.*

1859 *Hood, William Charles, Esq., M.D. *Bethlehem Hospital, S.*

1865 *Hooker, Joseph, Esq., M.D., F.R.S., F.L.S., &c. *Director of the Royal Gardens, Kew.*

1868 Hooper, Alf., Esq. *Fairfield, Upper Sydenham; and 30, Moorgate-street, E.C.*

1861 Hopcraft, George, Esq. 3, *Billiter-square, E.C.*

1846 *Hope, Alex. James Beresford, Esq. *Arklow-house, Connaught-place, Hyde-park, W.; and Bedgebury-park, Hurst-green, Kent.*

1862 Hope, Capt. C. Webley, R.N. *H.M.S. 'Brisk,' Australia; Messrs. Hallett & Co.*

1869 Horne, Charles, Esq., H.M. Ind. Civ. Serv. *"Junisfail," Beulah-hill, Upper Norwood.*

1849 Horrex, Theophilus, Esq. 16, *Connaught-square, Hyde-park, W.*

1868 1050Horton, James Africanus B., Esq., M.D., &c. *Care of Sir John Kirkland, 17, Whitehall-place, S.W.*

1861 Hoskins, Capt. A. H., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*

1859 Hoskyns, Chandos Wren, Esq. *Wroxhall-abbey, Warwickshire.*

1853 Houghton, Lord. 16, *Upper Brook-street, W.; The Hall, Bawtry; and Fryston-hall, Ferrybridge, Yorkshire.*

1856 Howell, William Hilton, Esq. *Goulburn, New South Wales. Care of Mr. W. Chamberlin, 74, Fleet-street, E.C.*

1869 Howard, John, Esq., C.E. *Exmouth, Devon.*

1855 Howard, Sir Ralph, Bart. 17, *Belgrave-sq., S.W.; and Bushy-park, Wicklow.*

1857 Howard, Samuel Lloyd, Esq. *Goldings, Loughton, Essex.*

1864 Howell, W. G., Esq.

1842 *Hubbard, J. Gellibrand, Esq. 24, *Prince's-gate, Hyde-park, S.W.*

1867 1060*Hubbard, William Egerton, Esq. *St. Leonard's-lodge, Horsham.*

1867 *Hubbard, William Egerton, Esq., Jun., B.A. *St. Leonard's-lodge, Horsham.*

1857 Hughes, Capt. Sir Frederic. *Ely-house, Wexford.*

1858 Hughes, William, Esq. 4, *Lawford-road, Kentish-town, N.W.*

1858 *Hume, Edmund Kent, Esq.

1860 *Hume, Hamilton, Esq. *Cooma Yass, New South Wales. Care of Rev. A. Hume, 24, Fitzclarence-street, Liverpool.*

Year of Election.	
1861	Hunt, George S. Lennox, Esq., H.B.M. Consul, *Pernambuco.*
1868	Hunt, John Percival, Esq., M.D. *Great Ouseburn, near York, Yorkshire.*
1866	Hunt, Joseph, Esq. *Coco-house Uxbridge, Middlesex.*
1865	Hunt, Capt. Thomas, R.H.A. *The Barracks, Maidstone.*
1857	1870Hunt, Zacharias Daniel, Esq. *Aylesbury.*
1868	Hunter, Major Edward. *Junior United Service Club, S.W.*
1862	Hunter, Henry Lumsey, Esq. *Beech-hill, Reading.*
1864	Hutchinson, Capt. R. R. 12, *Furnival's-inn, Holborn, W.C.*
1858	Hutchinson, Thomas J., Esq., F.R.S.L., F.R.S., F.A.S.L., H.B.M. Consul, *Rosario, Argentine Republic. Care of J. B. Alston, Esq., Foreign-office.*
1869	Huxley, Thomas H., Esq., F.R.S., &c. 28, *Abbey-place, St. John's-wood, N.W.*
1860	*Hyde, Captain Samuel. 8, *Billiter-square, E.C.*
1865	Illingworth, Rev. Edward A. 3, *Mecklenburg-street, W.C.*
1852	Illingworth, Richard Stonhewer, Esq. 9, *Norfolk-crescent, Hyde-park, W.*
1850	*Imray, James Frederick, Esq. 102, *Minories, E.; and Beckenham, Kent, S.E.*
1867	1870Ince, Joseph, Esq., F.L.S., &c., &c. 26, *St. George's-place, Hyde-park-corner, W.*
1861	*Ingall, Samuel, Esq. *Forest-hill, Kent, S.E.*
1860	Ingilby, the Rev. Sir Henry John, Bart. *Ripley-castle, Ripley, Yorkshire.*
1851	Inglefield, Admiral Edward A., C.B., F.R.S. *United Service Club, S.W.; and 10, Grove-end-road, St. John's-wood, N.W.*
1846	Ingram, Hughes Francis, Esq. *University Club, S.W.*
1869	Inman, Robert Matthew, Esq. *Bellcourt, Herts.*
1860	*Inskip, Staff Commander G. H., R.N. *H.M. Surveying Vessel 'Porcupine;' and 8, Park-place-west, Sunderland.*
1852	*Inskip, Rev. Robert Mills. 8, *Boon's-place, Plymouth.*
1840	*Irby, Frederick W., Esq. *Athenæum Club, S.W.*
1864	*Irving, John, Esq.
1853	1870Irving, Thomas, Esq.
1861	Irwin, James V. H. 10, *Nottingham-place, Euston-road, N.*
1864	Irwin, W. F., Esq., B.A. *St. John's School, Limehouse, E.*
1865	Izard, Frederick, Esq., 70, *New Bond-street, W.*
1866	Jackson, Robert Ward, Esq. 28, *Inverness-road, Hyde-park, W.*
1855	Jackson, William, Esq. 44, *Portland-place, W.*
1862	Jacomb, Thomas, jun., Esq. 23, *Old Broad-street, Gresham-house, E.C.*
1857	James, Colonel Sir Henry, R.E., F.R.S. *Director of the Ordnance Survey, Southampton.*
1861	James, William Boxville, Esq. 15, *Blomfield-road, Maida-hill, W.*

Year of Election	
1868	Jamieson, Richard Alexander, Esq., M.A. *St. Luke's, Cork; and care of J. P. Watson, Esq., 85, Gracechurch-street, E.C.*
1868	1100 Jamieson, Hugh, Esq. *Junior Carlton Club, S.W.*
1862	*Jaques, Leonard, Esq. *Wentbridge-house, Pontefract, Yorkshire.*
1863	*Jardine, Andrew, Esq. *Lanrick-castle, Stirling.*
1883	*Jardine, Robert, Esq., M.P. *Castlemilk, Lockerby, N.B.*
1837	Jefferson, Richard, Esq. *A4, The Albany, W.*
1865	Jeffreys, J. G., Esq. *23, Devonshire-place, W.*
1860	*Jejeebhoy, Sir Jamsetjee, Bart. *Bombay.*
1854	Jellicoe, Charles, Esq. *12, Cavendish-place, W.*
1859	Jencken, H. Diedrich, Esq. *1, Brick-court, Temple, E.C.; and 2, York-terrace, Upper Sydenham, S.E.*
1854	Jenkins, Capt. Griffith, I.N., C.B. *East India Club, St. James's-square, S.W., and Derwen, Welsh Pool, Montgomeryshire.*
1837	1110 *Junkins, R. Castle, Esq. *Beechley, near Chepstow.*
1854	*Jennings, William, Esq., M.A. *13, Victoria-street, Westminster, S.W.*
1860	Jermyn, Rowland Formby, Esq. *War Office, S.W.*
1860	Jessopp, Rev. Augustus, M.A., Head Master, King Edward VI. School. *Norwich.*
1864	*Jeula, Henry, Esq. *Lloyd's, E.C.*
1864	*Jeyes, *V. F.*, Esq. *Castle-hill, Ealing, W.*
1847	Johnson, Edmund Chas., Esq. *12, Wilton-street, Belgrave-square, S.W.*
1859	*Johnson, Henry, Esq. *Messrs. Johnson, 7, Bedford-row, Worthing, Sussex.*
1854	Johnson, John Hugh, Esq.
1861	Johnson, William, Esq., B.A. *Junior Carlton Club, S.W.*
1866	1120 Johnson, W. H., Esq., Civil Assistant G. T. S. India. *Dehra Dun, N.W. Provinces, India.*
1843	Johnston, Alex. Keith, Esq., F.R.S.E., Hon. Mem. Berl. Geog. Soc., &c. *Marchhall-park; and 4, St. Andrew-square, Edinburgh.*
1868	*Johnston, Alexander Keith, Esq., jun. *74, Strand, W.C.*
1850	Johnston, A. K., Esq., F.R.S.E. *Heatherley, Sandhurst, near Wokingham.*
1857	Johnston, J. Brookes, Esq. *29, Lombard-street, E.C.*
1868	Johnston, Thomas, Esq. *12, Camden-place, Bath; and King Edward VI. Grammar-school, Bath.*
1866	Johnstone, Colonel H. C. *Murree, Punjab, India. Care of Messrs. H. S. King and Co., Cornhill, E.C.*
1867	*Johnstone, John, Esq. *Castlemain-house, Marlow, S.W.*
1858	Jones, Capt. Edward Monckton, 20th Regt. *Sandhurst, Wokingham, Berks.*
1864	Jones, Captain Felix, late I.N. *Fernside, Church-road, Weston-hill, Upper Norwood, S.*
1868	1150 Jones, Capt. H. M., V.C. *Care of the Foreign-office, S.W.*
1857	Jones, Lt.-Colonel Jenkin, Royal Engineers. *1, Lennard-place, Circus-road, St. John's-wood, N.W.; and India.*
1862	Jones, John, Esq. *338, Strand, W.C.*
1861	Jones, John Pyrce, Esq. *Grove-park School, Wrexham.*
1861	Jones, Sir Willoughby, Bart. *Cranmer-hall, Fakenham, Norfolk.*

Year of Election		
1868		Jones, William S., Esq. 2, *Verulam-buildings, Gray's-inn, W.C.*
1867		*Jordan, Wm. Leighton, Esq. 1, *Penn-square, Notting-hill, W.*
1863		Joshua, Moss, Esq. *Melbourne; and 22, Clifton-gardens, Maida-hill, W.*
1868		Kantzow, Capt. H. P. de, R.N. *United Service Club, S.W.*
1858		Kay, David, Esq. 19, *Upper Phillimore-place, Kensington, W.*
1865	1140	Kaye, J. W., Esq. *India Office, S.W.*
1860		Kents, B. W., Esq., Lieutenant-Governor, *Trinidad.*
1857		Keating, Sir Henry Singer, Q.C., one of the Judges of the Court of Common Pleas, 11, *Prince's-gardens, S.W.*
1857		Keene, Rev. C. E. Buck. *Swyncombe-park, Henley-upon-Thames.*
1863		Keir, Simon, Esq. *Conservative Club, S.W.*
1845		*Kellett, Br.-Adm. Henry, C.B. *Clonmel, Ireland.*
1858		Kellie, Right Hon. the Earl of. 28, *Eaton-place, S.W.; Carlton-Club; and Alloa-park, Scotland.*
1861		Kelly, William, Esq. *Royal Thames Yacht Club, 7, Albemarle-street, W.*
1860		*Kemball, Col. Sir Arnold Burrowes, C.B., Indian Army. 2, *Oxford-square, W.; and United Service Club, S.W.*
1863		Kempster, J., Esq. 1, *Portsmouth-place, Kennington-lane, Surrey, S.*
1861	1150	Kennard, Adam Steinmetz, Esq. 7, *Fenchurch-street, E.C.*
1859		Kennard, Coleridge J., Esq. 14, *Lombard-street, E.C.*
1861		Kennard, Robert William, Esq. 37, *Porchester-terrace, Hyde-park, W.*
1861		Kennedy, Edward Shirley, Esq.
1854		Kennedy, Rev. John, M.A. 4, *Stepney-green, E.*
1863		Kerr, J. H., Esq., Staff-Commr. R.N. *Hydrographic-office, S.W.*
1867		Kerr, Robt. M., Esq., (Judge of the City of London Court). 7, *Chester-terrace, Regent's-park, N.W.*
1864		Kerr, Lord Schomberg. 15, *Berdon-street, W.*
1862		Kershaw, Wm., Esq. 16, *St. Mary Axe, E.C.; and Suffolk-lodge, Brixton-road, S.*
1862		Key, J. Binney, Esq. *Oriental Club, W.*
1857	1160	Keysell, Francis P., Esq. *Sycamore-villa, 35, Carlton-hill, St. John's-wood, N.W.*
1864		*Kiddle, W. W., Esq. *East Dereham, Norfolk.*
1864		Kimber, Dr. E. *Marchioness-house, Dulwich, S.E.*
1846		King, Lieut.-Colonel Edward E., 36th Regt. *Junior United Service Club, S.W.*
1866		King, John, Esq. *Compton-field-place, Guildford, Surrey.*
1861		King, Major W. Ross, Unatt., F.S.A. Scot. *Tarlowie, Kinellar, Aberdeenshire; and Army and Navy Club, S.W.*
1868		Kingsley, Henry, Esq. *Wargrave, Henley-on-Thames, Berks; and Garrick Club, W.C.*
1857		*Kinnaird, Hon. Arthur F., M.P. 2, *Pall-mall-east, S.W.*

Year of Election.		
1867		Kinnaird, George William Fox, Lord, K.C. *Rossie-priory, Inchture, N.B.; and 33, Grosvenor-street, W.*
1860		Kinns, Samuel, Esq., PH. DR., F.R.A.S. *Highbury-new-park College, N.*
1858	1170	Kirk, John, Esq., M.D. *45, George-square, Edinburgh.*
1863		Kirke, John, Esq., Barrister. *C. Thorold, Esq., Welham, Retford, Notts.*
1861		Kirkland, Sir John. *17, Whitehall-place, S.W.; and Foot's-cray-place, Kent, S.E.*
1868		Kisch, Daniel Montagu, Esq. *1, Devonshire-place, Seven Sisters'-road, Upper Holloway, N.*
1866		*Kitson, James, Jun., Esq. *Hanover-square, Leeds.*
1868		Kitto, Richard L. Middleton, Esq. *Church-hill-villa, Fryerstown, Victoria, Australia.*
1855		*Kjaer, Thomas Andreas, Esq. *Hjornet af Kongens Nytorv og Gothersgaden, No. 20, 3d Stal, Copenhagen.*
1867		Knight, Andrew Halley, Esq. *76, Westbourne-terrace, Hyde-park, W.*
1862		Knollys, Lieut.-General Sir William T., K.C.B., V.-Pres. Council of Military Education. *Eaton-square, S.W.*
1867		Knox, Alex. A., Esq. *91, Victoria-street, Westminster, S.W.*
1861	2180	Knox, Thomas G., Esq. *India. Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.*
1866		Kupsch, Henry, Esq. *Custom-house, Shanghai. Care of H. C. Batchelor, Esq., 155, Cannon-street, E.C.*
1861		Kyd, Hayes, Esq., M.R.C.S. *Wadebridge, Cornwall.*
1859		Labrow, Lieut.-Colonel Valentine H., F.S.A., F.G.S. *Milre-court-chambers, Temple, E.C.; and Club-chambers, S.W.*
1849		*Laffan, Capt. Robert Michael, R.E. *Army and Navy Club, S.W.; and Otham-lodge, Kent.*
1869		Lamb, Hon. Edward William. *Brisbane, Queensland, Australia.*
1859		Lamb, Lieut. Henry, R.N. *H.M. India Store Department, Belvedere-road, Lambeth, S.*
1863		*Lambert, Alan, Esq. *Heath-lodge, Putney-heath, S.W.*
1864		Lambert, Charles, Esq. *2, Queen-street-place, Upper Thames-street, E.C.*
1868		Lambert, Francis D., Esq. *20, Devonshire-place, Portland-place, W.*
1867	1170	Lambert, Wm. Blake, Esq., C.B. *3, Morden-road, Blackheath, S.E.*
1864		Lamert, Capt. G. F. *20, Albemarle-street, W.*
1861		Lamont, James, Esq. *Knockloe, Greenock, N.B.*
1866		Lampray, John, Esq. *16, Camden-square, N.W.*
1867		Lamprey, James, Esq., M.D., 67th Regt. *Waterford, Ireland.*
1864		Lamprey, C. M., Esq. *64, Queen-street, Cheapside, E.C.*
1838		*Lance, John Henry, Esq., F.L.S. *The Holmwood, Dorking.*

Year of Election	
1868	Lane, Rev. W. W., B.A.
1861	*Lang, Andrew, Esq. *Dunmore, Hunter-river, New South Wales; and Dunmore, Teignmouth, Devon.*
1859	*Lange, Daniel A., Esq. 21, *Regent-street, W.*
1867	†200Langlands, John, Esq., Engineer. *Melbourne, Australia.*
1865	Langley, Edward, Esq. *Well-hall, Eltham, Kent.*
1856	*Langler, John R., Esq., B.A. *Wesleyan Training College, Westminster; and Gothic-villa, 2, Bridge-road-east, Battersea, S.W.*
1833	*Larcom, Maj.-General Sir Thomas Aiskew, K.E., K.C.B., F.R.S. *Castle, Dublin.*
1861	Lardner, Col. John. *United Service Club, S.W.*
1859	Larnach, Donald, Esq. 21, *Kensington-palace-gardens, W.*
1854	Latrobe, Ch. J., Esq. *Clapham-house, Lewes, Sussex.*
1869	Laughton, J. K., Esq. *Denton-house, Victoria-road, Southsea; and Royal Naval College, Southampton.*
1846	*Law, Hon. H. Spencer, M.A. 40, *Eaton-place, S.W.*
1861	Lawrence, Edward, Esq. *Beechmont, Aigburth, Liverpool.*
1868	1210Lawrie, James Esq., 63, *Old Broad-street, E.C.*
1867	Lawson, Wm., Esq. 21, *Waltham Grove, Fulham, S.W.*
1862	*Lay, Horatio, N., Esq.
1857	Layard, Right Hon. Austen H., D.C.L. 150, *Piccadilly, W.*
1866	*Layard, Lieutenant Brownlow Villiers (3rd W. India Regt.). 38, *Upper Mount-street, Dublin; and Lane's Hotel, 1, St. Alban's-place, S.W.*
1868	Laybourne, Augustine, Esq. 9, *King-street, Finsbury-square, E.C.; and Loughton, Essex.*
1863	*Leaf, Chas. J., Esq. *Old-change, E.C.; and The Hylands, Norwood, S.*
1869	*Leaf, F. H., Esq. *Burlington-lodge, Streatham-common, S.W.*
1861	*Learmonth, Dr. John. 11, *Gloucester-gardens, Hyde-park, W.*
1860	Lebour, G. A., Esq. 6, *Addison-crescent, Kensington, W.*
1853	1220*Le Breton, Francis, Esq. 21, *Sussex-place, Regent's-park, N.W.*
1868	Le Couteur, Lt.-Col. J. Halkett. 17, *Chapel-street, Belgrave-square, S.W.*
1865	Le Fevre, W. H., Esq., C.E. 9, *Dowgate-hill, Cannon-street, E.C.*
1861	Leckie, Patrick C., Esq. 7, *Palace-road, Rowsell-park, Streatham, S.*
1868	Lee, John, Esq. 30, *Berkeley-villas, Loughborough-park, S.*
1868	Lee, Sir Geo. Philip, Bart. 28, *Eryngton-square, W.*
1869	Lee, Thomas, Esq. *Royal Institution, Albemarle-street, W.*
1833	*Lefevre, Sir John George Shaw, M.A., D.C.L., F.R.S., Vice-Chancellor of the University of London. 18, *Spring-gardens, S.W.*
1853	Lefroy, General John Henry, R.A., F.R.S. 82, *Queen's-gate, W.*
1862	Leggatt, Clement Davidson, Esq. 43, *Inverness-terrace, W.*
1851	1230Legh, Wm. John, Esq. 37, *Lowndes-square, S.W.; and Lyme-park, Cheshire.*
1861	*Lehmann, Frederick, Esq. 139, *Westbourne-terrace, W.*
1845	Leigh, John Studdy, Esq., F.G.S. 8, *Old Jewry, E.C.*
1863	Le Mesurier, Henry P., Esq., C.E. *St. Martin's, Guernsey.*

Year of Election	
1863	Le Mesurier, M.-Gen. A. P. 2, *Stanhope-terrace, Hyde-park, W.*
1856	Leslie, the Hon. G. W. 4, *Harley-street, W.*
1867	L'Estrange, Carleton, Esq. *Carlton Club, S.W.*
1840	*Letts, Thomas, Esq. 8, *Royal Exchange, E.C.*
1863	Leveaux, E. H., Esq. 25, *The Cedars, Putney, S.W.*
1857	Leverson, George B. C., Esq. 73, *Gloucester-terrace, Hyde-park, W.*
1869	1240Leveson, Edward J., Esq. *Newlands, Sydenham, S.E.*
1862	Levick, Joseph, Esq. 8, *Great Winchester-street, Old Broad-street, E.C.*
1866	Levinge-Swift, Richard, Esq. *Levinge-lodge, Richmond, Surrey.*
1859	Levinsohn, Louis, Esq. *Vernon-house, Cirencester-gardens, Maida-hill, W.*
1865	Lévy, William Hanks, Esq. *Institution of the Association for the Welfare of the Blind, 210, Oxford-street, W.*
1852	Leyester, Captain Edmund M., R.N. 5, *Donegal-terrace, Stoke, Devonport.*
1861	Leyland, Luke Swallow, Esq. *The Leylands, Hatfield, Doncaster.*
1859	Lichfield, Thomas George, Earl of. *Shugborough, Staffordshire.*
1869	Ligar, C. W., Esq., Surveyor General of Victoria. 4, *Royal Exchange-avenue, E.C.; and Melbourne.*
1856	Lilford, Thomas Littleton Powys, Lord. 10, *Grosvenor-place, W.*
1860	1250Lindsay, H. Hamilton, Esq.
1857	Lindsay, Major-General the Hon. J., Grenadier Guards, M.P. 20, *Portman-square, W.*
1867	*Lindsay, Col. Robert J. L., R.P., V.C. *Lockinge-house, Wantage, Berks; and 2, Carlton-gardens, S.W.*
1855	*Lindsay, Wm. S., Esq. *Manor-house, Shepperton, Middlesex.*
1869	Lindsey, Mark John, Esq. 32, *Ludgate-hill, E.C.; and Burnt-ash-lane, Lee, Kent.*
1868	Linton, Robert P., Esq., Surg.-Major. 14, *St. James's-square, S.W.*
1858	Lister, John, Esq.
1866	Little, Archibald J., Esq. 34, *Brook-street, Grosvenor-square, W.*
1857	*Lloyd, George A., Esq. *George-yard, Lombard-street, E.C.*
1863	Lloyd, Sir Thomas Davis, Bart. *United University Club, S.W.; and Bronwydd, Carmarthen.*
1864	1260Lloyd, W., Esq. *Moor-hall, near Sutton Coldfield.*
1867	Lloyd, Rev. Wm. V., M.A. 16, *Lancaster-gate, W.*
1861	Llwellyn, Capt. Richard. 20, *Montagu-square, W.*
1869	Llwellyn, Captain William E., R.A. *Army and Navy Club, S.W.*
1868	Lobley, James L., Esq. 50, *Lansdowne-road, Kensington-park, W.*
1863	Loch, George, Esq. 12, *Albemarle-street, W.*
1859	Loch, Henry Brougham, Esq. *Government-house, Isle of Man.*
1861	Loch, John Charles, Esq. 12, *Albemarle-street, W.; and Hong-Kong.*
1857	Loch, William Adam, Esq. 8, *Great George-street, Westminster, S.W.*
1864	Locke, John, Esq. 8A, *Addison-road, Kensington, W.*
1858	Lockhart, William, Esq., F.R.C.S. *Park-villas, Gromville-park, Blackheath, S.E.; and Chine.*

Year of Election	
1860	1270Lockwood, James Alfred. *United Arts Club, Hanover-square, W.*
1856	*Logan, Sir William Edmond, F.R.S. *Montreal, Canada.*
1860	Londesborough, Wm. Henry Forester, Lord. 3, *Grosvenor-square, W.*
1850	*Long, George, Esq., M.A. 22, *Buckingham-street, Brighton.*
1857	*Long, W. Beaston, Esq.
1858	Longden, Merrell D., Esq. 4, *Exminster-place, Hyde-park, S.W.*
1865	*Longley, Major George, R.E. 60, *Prince's-gate, W.*
1847	Longman, Thos., Esq. *Paternoster-row, E.C.; and 8, Sussex-sq., Hyde-park, W.*
1858	Longman, William, Esq. 38, *Hyde-park-square, W.*
1861	Lonsdale, Arthur Pemberton, Esq.
1860	1280Looker, William Robert, Esq. *Melbourne, Australia. Care of Mr. Ashhurst, 16, Bishopsgate-street-within, E.C.*
1856	Lovett, Phillips Cosby, Esq. *Lincombe-ho., Lincombe, Leighton Buzzard, Bucks.*
1867	Low, Alex. F., Esq. 84, *Westbourne-terrace, W.*
1861	Low, Robert, Esq. 17, *Woburn-square, W.C.*
1863	Low, S. P., Esq. 55, *Parliament-street, S.W.*
1858	Lowden, Rev. George Rouse. *Brynt-villa, Hanwell, Middlesex.*
1859	Lowe, Capt. W. Drury. *Myrin, Bettws-y-Coed, Llanrwst, North Wales.*
1863	Lowndes, E. C., Esq. 84, *Eaton-place, S.W.*
1830	Lowry, Joseph Wilson, Esq. 45, *Robert-street, Hampstead-road, N.W.*
1860	Loyd, Col. W. K. *Union Club, S.W.*
1866	1290Luard, Wm. Charles, Esq. *Llandaff-house, Cardiff; and Athenæum Club, S.W.*
1860	Lumsden, Rev. Robert Conyn, M.A. *Cheadle, Manchester.*
1860	Lush, Robert, Esq., Q.C. *Balmoral-house, Avenue-road, Regent's-park, N.W.*
1866	Lydall, J. H., Esq. 12, *Southampton-buildings, Chancery-lane, W.C.*
1869	Lys, John Gaunt, Esq. 18, *Prince of Wales-terrace, Kensington, W.*
1830	*Lyell, Sir Charles, Bart., M.A., LL.D., F.R.S. 73, *Harley-st., Cavendish-sq., W.*
1837	*Lynch, Capt. H. Blosse, I.N., C.B., F.R.A.S. *Athenæum Club, S.W.*
1861	*Lynch, Thomas Kerr, Esq. 31, *Cleveland-square, Hyde-park, W.*
1858	Lyne, Francis, Esq.
1862	*Macarthur, Major-Gen. Sir Edward, K.C.B. 27, *Prince's-gardens, W.*
1863	1300Macbraire, James, Esq. *Broadmeadows, Berwick-on-Tweed.*
1862	Macdonald, Chesborough C., Esq. 32, *Belsize-park, Hampstead, N.W.*
1843	Macdonnell, Sir Richard Graves, C.B., late Governor of S. Australia.
1865	Macfarlan, John G., Esq. *Clyde-villa, Anerley-hill, Upper Norwood.*
1865	Macfie, Rev. M. *Monday-road, Birmingham.*
1866	MacGregor, Capt. C. M. *Simla, Care of Messrs. Grindlay.*
1861	Mackintosh, Alexander Brodie, Esq. *Oriental Club, W.; and Dawson, Scotland.*

Year of Election	
1845	*Maciotyre, Patrick, Esq., F.S.A., Off. Assoc. Inst. Act. 1, *Maida-hill, W.*
1868	Mackay, Dr. A. E., R.N. *Admiralty, Somerset-house, W.C.*
1859	Mackay, Rev. Alexander, LL.D. 1, *Hutton-place, Grange, Edinburgh.*
1859	1310*Mackeun, Thos. W. L., Esq. *Bank of British Columbia, 5, East India-avenue.*
1845	Mackenzie, Right Hon. Holt, F.R.A.S. *Athenæum Club, S.W.; and 28, Wimpole-street, W.*
1860	*Mackenzie, James T., Esq. 69, *Lombard-street, E.C.*
1863	Mackenzie, John H., Esq. *Wallington, Carshalton, Surrey.*
1864	*Mackeson, Edward, Esq. 59, *Lincoln's-inn-fields, W.C.*
1839	Mackillop, James, Esq., F.R.A.S. 30, *Grosvenor-square, W.*
1862	Mackinlay, D., Esq. *Oriental Club, W.*
1867	Mackinlay, John, Esq., J.P., M.I.C.E., Chief Engineer and Inspector of Machinery, H.M. Dockyard, and Surveyor to the Port, Bombay. *Care of Charles Bannerman, Esq., 195, Camberwell-new-road, Kennington, S.*
1864	Mackinnon, C. D., Esq. *Care of Messrs. J. Cleach and Sons, 31, Abchurch-lane, E.C.*
1861	Mackinnon, Lachlan, Esq. *Mountbilly, Par-Cornwall; and Reform Club, S.W.*
1855	1320*Mackinnon, Wm. Alex., Esq., M.P., F.R.S. 4, *Hyde-park-place, W.*
1865	*Mackinnon, W., Esq. *Balinakiel-by-Hunbert, Argyleshire.*
1860	Mackirdy, M.-Gen. Elliot, 69th Rgt. *U.S. Club, S.W.; and Toughoo, Burmah.*
1860	Maclean, William Crighton, Esq., F.R.S. 31, *Camperdown-pl., Great Yarmouth.*
1859	MacLeay, George, Esq. 35, *Hyde-park-gardens, W.*
1867	Maclonghlin, David, Esq., M.D., Member of Legion of Honour, &c. 22, *Maddox-street, W.*
1855	Maclure, Andrew, Esq. *Maclure, Macdonald, and Macgregor, 37, Wallbrook, E.C.*
1861	Maclure, John William, Esq. *Fallowfield, near Manchester.*
1860	Macmillan, Alex., Esq. 16, *Bedford-street, Covent-garden, W.C.*
1855	Macnab, John, Esq. *Finallater-lodge, Trinity, near Edinburgh.*
1868	1330Macnair, Geo. Esq. *Oriental Club, Hanover-square, W.*
1861	Macpherson, William, Esq. 32, *Lancaster-gate, W.*
1845	*Macqueen, James, Esq., K.S. Tower and Sword of Portugal. 10, *Hanlon-street, Kensington, W.*
1865	Macteggart, Malcolm, Esq. *Sydney, New South Wales.*
1863	McArthur, Alex., Esq. *Raleigh-hall, Brixton-rise, Brixton, S.*
1867	McArthur, William, Esq. 1, *Gayder-houses, Brixton-rise, S.*
1860	McClintock, Capt. Sir Francis Leopold, R.N. *United Service Club, S.W.*
1861	*McConnell, W. R., Esq., Barrister-at-Law. 12, *King's-Bench-walk, E.C.; and Charleville, Belfast.*
1862	McCosh, John, Esq., M.D. *Junior United Service Club, S.W.*
1855	*M'Clure, Admiral Sir Robert J. le M., C.B. *Chipperfield, Herts; and Athenæum Club, S.W.*
1865	1340McDonald, James, Esq. *Oriental Club, Hanover-square, W.*
1865	McEnen, D. P., Esq. 24, *Pembridge-square, Bayswater, W.*
1863	McEwan, James, Esq. 30, *Holland-park, Kensington, W.*
1855	McGregor, Duncan, Esq. *Board of Trade, S.W.; and Athenæum Club, S.W.*

Year of Election	
1867	McGregor, Duncan, Esq. *Clyde-place, Glasgow.*
1869	McGrigor, Alexander Bennett, Esq. 19, *Woodside-terrace, Glasgow.*
1866	*McIver, W. G., Esq., *Superintendent of Chinchona Plantations, Ootacamund, Madras.*
1858	McKerrell, Robert, Esq. 45, *Inverness-terrace, W.; and Mauritius.*
1868	McLaren, Robert, Esq. 6, *Räcknitz-platz, Dresden. Care of Messrs. McLaren and Co., 5, South Hanover-street, Glasgow.*
1868	McLean, Frank, Esq., M.A., C.E. 23, *Great George-street, Westminster, S.W.*
1867	1350McLean, Hon. John. *Oamaru, New Zealand. Care of Messrs. Redfern, Alexander, and Co., 3, Great Winchester-street-buildings, E.C.*
1852	M'Leod, Walter, Esq. *Head Master of the Royal Military Asylum, Chelsea, S.W.*
1868	McNair, Capt. John F. A., R.A.
1839	M'Neil, The Right Hon. Sir John, G.C.B. *Granton, near Edinburgh.*
1859	Maitland, Geo. Gammie, Esq. *Shotover-house, Wheatley, Oxon.*
1845	*Major, Richard Henry, Esq., F.S.A. *British Museum, W.C.*
1858	*Makins, Henry F., Esq. 19, *Prince of Wales-terrace, Kensington-palace, W., and Reform Club, S.W.*
1856	Malby, John Walter, Esq. 15, *Richmond-villas, Seven-sisters'-rd., Holloway, N.*
1853	*Malby, Thomas, Esq. 2, *Park-villas, Seven-sisters'-road, Holloway, N.*
1862	*Malcolm, Capt. Edward Donald, R.E. *Chatham.*
1865	1360Malcolm, Jas., Esq. 22, *Prince's-gate, Knightsbridge, W.*
1843	*Malcolm, W. E., Esq. *Burnfoot, Langholme, near Carlisle.*
1853	*Mallet, Charles, Esq. *Audit Office, W.C.; and 7, Queensborough-terrace, Bayswater, W.*
1860	Mann, James Alexander, Esq., M.R.A.S. *Brecon and Merthyr Tydvil Railway, Brecon.*
1866	Mann, Robert James, Esq., M.D. 1, *Douglas-villas, Surbiton-hill, and 15, Buckingham-street, Strand, W.C.*
1866	Manners, Geo., Esq., F.S.A. *Lansdowne-road, Croydon.*
1868	Manners-Sutton, Graham, Esq., 7, *Gloucester-terrace, Hyde-park, W.*
1858	Manning, Frederick, Esq. *Byron-lodge, Leamington; and 8, Dover-street, W.*
1864	*Mansell, Capt. A. L. *Hydrographic-office, Admiralty, S.W.*
1869	Mantell, Sir John Hen. 5, *Pump-court, Temple, E.C.*
1859	1370Mantell, Walter Baldock Durant, Esq. *Wellington, New Zealand. Care of E. Stanford, Esq.*
1869	March, Edward Bernard, Esq., H.M. Consul, Fiji Islands. 12, *Buckingham-street, Strand, W.C.*
1860	Mariette, Prof. Alphonse, M.A. 27, *St. Stephen's-square, Bayswater, W.*
1854	Markham, Clements Robert, Esq. *India Office, S.W.; and 21, Eccleston-sq. S.W.*
1857	Marlborough, George, Duke of, *Blenheim, Woodstock. Care of E. Stanford, Esq.*
1864	Marsden, Rev. Canon J. H. *Higher Broughton, Manchester.*
1857	Marsh, Matthew Henry, Esq. *Oxford and Cambridge Club, S.W.; and 41, Rutland-gate, S.W.*

Year of Election	
1862	Marshall, Capt. J. G. Dor. *Downton, Wilts.*
1854	Marshall, James Garth, Esq. *Headingley, near Leeds; and Monk Coniston, Ambleside.*
1862	Marshall, William, Esq. 4, *Paper-buildings, Inner Temple, E.C.*
1850	1380*Marsham, the Hon. Robert. 5, *Chesterfield-street, Mayfair, W.*
1857	Marsham, J. C., Esq. 7, *Kensington-palace-gardens, W.*
1867	Marthin, Guillermo E. de, Con.-General United States of Columbia. 12, *Orchard-street, Portman-square, W.*
1857	Martin, Francis F. B., Esq.
1861	Martin, Henry, Esq. *Sussex-house, Highbury-new-park, N.*
1860	*Martin, Richard Biddulph, Esq. *Clarewood, Bickley, S.E.*
1862	Martin, Thomas, Esq. 5, *Compton-terrace, N.*
1867	Martin, Wm., Esq. 37, *Cleveland-square, Paddington, W.*
1865	Masarvon, Wm. R., Esq.
1845	*Mathieson, Sir James, Bart., F.R.S. 13, *Cleveland-row, S.W.; and Ashmy, Bonar-bridge, Sutherlandshire, &c.*
1858	1390Mathieson, James Ewing, Esq. 77, *Lombard-street, E.C.; and 16, Queen's-gardens, Bayswater, W.*
1862	Maude, Col. Francis Cornwallis, R.A., F.C., &c. *Army and Navy Club, S.W.*
1868	Mavrogordato, M. Lucas. *Belgrave-mansions, Grosvenor-gardens, S.W., and Messrs. Ralli, Brothers, 25, Finsbury-circus, E.C.*
1860	*Maxwell, Sir William Stirling, Bart. 128, *Park-street, Grosvenor-sq., W.*
1855	May, Daniel John, Esq., R.N., Staff-Commr. *Care of Cox and Londensack.*
1858	Mayer, Joseph, Esq., F.S.A. 68, *Lord-street, Liverpool.*
1861	Mayers, William S. F., Esq., Interpreter to H.M. Consulate. *Shanghai. Care of F. J. Saylor, Esq.*, 12, *George-yard, Lombard-street, E.C.*
1857	Mayhew, Rev. Samuel Martin. 158, *New Kent-road, S.*
1862	Mayne, Captain Richard Charles, R.N., C.B. 80, *Chester-square, S.W.*
1858	Mayo, Capt. John Pole. *Army and Navy Club, S.W.*
1867	1400Mayson, John S., Esq. (J. P. for county of Lancashire). *Oakhill, Fallowfield, near Manchester.*
1863	Meade, the Hon. Robert Henry. *Foreign Office, S.W.; and 3, Belgrave-square, S.W.*
1862	*Medlycott, Lieut. Mervyn B., R.N. *Care of Messrs. Woodhead.*
1854	Melvill, Col. Sir Peter Melvill, Mil. Sec. to the Bombay Gov. 27, *Palmeira-square, Brighton.*
1838	Melvill, Philip, Esq., F.R.A.S. *Ethy-house, Lostwithiel, Cornwall.*
1868	Merewether, Col. William Lockyer, C.B. *Kurrachee.*
1863	Mercier, Rev. J. J. *Hanwell, W.*
1842	*Merivale, Herman, Esq., C.B., Under Sec. of State for India, *India Office, S.W.; and 26, Westbourne-terrace, W.*
1866	Mesnier, Charles A., Esq. *Barwick, near Yeovil, Somerset.*
1867	Metcalfe, Frederic Morehouse, Esq. *Wisbech, Cambridgeshire.*

Year of Election	
1837	1410*Mexborough, John Chas. Geo. Earl of. 38, *Dover-street, W.*; and *Methley-park, near Leeds.*
1863	*Michell, Lieut.-Colonel J. E., R.E.R.A.
1868	Michell, Robert, Esq. 17, *King-street, St. James's, S.W.*
1863	*Michin, A., Esq. 28, *Austin-friars, E.C.*
1848	Middleton, Rear-Admiral Sir G.N. Broke, Bart., *H.M.S. 'Hero,' Sheerness*; and *Broke-hall, Suffolk.*
1866	*Miers, Jno. William, Esq., C.E. 74, *Addison-road, Kensington, W.*
1859	Milaud, John, Esq. *Clairville, Lonsdown-road, Wimbledon.*
1866	Mildmay, Capt. Herbert St. John (Rifle Brigade). 19, *Clarke-street, Berkeley-square, W.*
1860	Miles, Rev. R. *Bingham, Notts.*
1861	*Miller, Commander Henry Matthew, R.N. *The Grove, Exeter*; and *Junior United Service Club, S.W.*
1868	1420Miller, Robert Montgomerie, Esq. *Calverden-grove, Tunbridge-wells.*
1853	*Miller, Capt. Thomas, R.N. *H.M.S. 'Royal George'* and *United Service Club, S.W.*
1861	Milligan, Joseph, Esq. 15, *Northumberland-street, W.C.*
1857	Mills, Arthur, Esq. 34, *Hyde-park-gardens, W.*
1863	*Mills, John E., Esq. *Kingswood-lodge, Tunbridge-wells.*
1864	Mills, Rev. John. 40, *Lonsdale-square, N.*
1863	*Milton, Viscount, M.P. 34, *Curzon-street, W.*
1860	Milman, Capt. Everard, Royal Horse Artillery. 5, *Waterden-crescent, Stoke, Guildford.*
1866	Milne, Vice-Admil. Sir Alex., K.C.B. *United Service Club, S.W.*
1867	Milner, Rev. John, B.A. *Chaplain of H.M.S. 'Galatea.'*
1860	1430Mitchell, Capt. Alexander. 6, *Great Stanhope-street, Park-lane, W.*
1862	*Mitchell, George, Esq. 22, *Bolton-street, Piccadilly, W.*
1864	Mitchell, Thomas, Esq., C.E. *Oldham.*
1859	Mitchell, Sir William. 6, *Hyde-park-gate, Kensington-gore, W.*
1865	Mitchell, Wm. H., Esq. *Junior Carlton Club, S.W.*
1851	*Mocatta, Frederick D., Esq. 35, *Gloucester-place, Portman-square, W.*
1853	Moffatt, George, Esq. 103, *Eaton-square, S.W.*
1868	Moffitt, John, Esq. 5, *Canning-place, South Kensington, W.*
1861	Mollison, Alexander Fullerton, Esq. *Woodcote, Tunbridge-wells.*
1842	*Montagu, Major Willoughby. *Clapham-common, S.*
1862	1440*Montague, Capt. Horace. 24, *Chapel-street, Park-lane, W.*
1830	*Montefiore, Sir Moses, Bart., F.R.S., F.R.S.S.A. 7, *Grosvenor-gate, Park-lane, W.*; and *East-cliff-lodge, Ramsgate.*
1859	Montgomerie, Capt. T. G., Engrs., 1st Asstt. Trig. Survey. *Care of Messrs. Alexander Fletcher & Co., 10, King's-arms-yard, Moorgate-street, E.C.*
1865	Montgomery, Sir Robert, K.C.B. 7, *Cornwall-gardens, Queen's-gate, W.*
1839	Moody, General R. C., R.E. *Cryptham-house, near Ludlow, Shropshire.*

Year of Election.	
1857	*Moor, Rev. Allan P., M.A., F.R.A.S. *Sub-Warden St. Augustine College, Canterbury.*
1863	Moore, H. Byron, Esq. *Survey Office, Melbourne, Australia. Care of Mr. Watkins, 100, St. Martin's-lane.*
1861	Moore, John Carrick, Esq. *Cornwall, Wiltonshire; Geological Society, W.C.; and 23, Bolton-street, W.*
1857	Moore, Major-General W. Y. *United Service Club, S.W.*
1863	More, R. Jasper, Esq. *Linley-hall, Salop.*
1869	1450*Morgan, Delmar, Esq. *5, Kensington-gardens-square, W.*
1864	Morgan, D. L., Esq. *H.M.S. 'Eurydice.'*
1861	Morgan, Junius Spencer, Esq. *13, Prince's-gate, Hyde-park, S.W.*
1861	Morgan, William, Esq., R.N. *1, Sussex-place, Southsea, Hants.*
1856	Morland, Lieut. Henry, late I.N. *Assistant Dockmaster, &c., Bombay.*
1839	*Morris, Charles, Esq. *University Club, S.W.*
1858	Morris, Eugene, Esq. *Birchwood, Sydenham, Kent.*
1863	Morrison, Col. J. D. *7, Albemarle-street, W.*
1868	Morrison, Martin C., Esq. *134, Shooter's-hill-road, Blackheath.*
1867	Morrison, Pearson, Esq. *Anglo-Italian Mining Co., 52, Moorgate-street, E.C.;*
1865	1460Morson, T., Esq. *124, Southampton-row, Russell-square, W.C.*
1869	Moser, Robert James, Esq. *45, Bedford-square, W.C.*
1869	Mott, F. T., Esq. *1, De Montfort-street, Leicester.*
1861	*Mount, Frederick J., Esq., M.D., Surgeon-Major and Inspector-General of Prisons, Bengal Army, &c. *Athenæum Club, S.W.; and 45, Arundel-gardens, Notting-hill, W. Care of Messrs. A. C. Lepage & Co., 1, Whitefriars-street, Fleet-street, E.C.*
1868	*Mounsey, Aug. Henry, Esq. *British Legation, Florence. Care of F. D. Alston, Esq., Foreign Office, S.W.*
1858	Mudie, Charles Edward, Esq.
1858	Mueller, Ferdinand, Esq., M.D., PH. DR. *Director of the Botanical Gardens, Melbourne. Care of Messrs. Dalton and Co., 37, Soho-square, W.*
1862	Muir, Francis, Esq., LL.D.
1855	Muir, Thomas, Esq. *24, York-terrace, Regent's-park, N.W.*
1867	*Muir, Thomas, Esq., Jun. *Madeira; and 24, York-terrace, Regent's-park, N.W.*
1869	1470Müller, Albert, Esq. *Eaton-cottage, South Norwood, S.*
1868	Mundella, A. J., Esq. *Nottingham.*
1869	Munton, Francis Kerridge, Esq. *21, Montagu-street, Russell-square, W.C.*
1868	*Murchison, John H., Esq. *Surbiton-hill, Kingston-on-Thames; and Junior Carlton Club, S.W.*
1859	Murchison, Kenneth R., Esq. *Manor-house, Bathford, Bath.*
1830	*Murchison, Sir Roderick Impey, Bt., K.C.B., G.C.St.A., M.A., D.C.L., V.P.R.S., G.S., and L.S., Grand Officer of the Order of the Crown of Italy, Director-General of the Geological Survey of Great Britain and Ireland, Trust. Brit. Mus., Hon. Mem. R.S. of Ed., R.I.A., Foreign Mem. of the Academy of Sciences, Paris, Mem. Acad. St. Petersburg, Berlin, Stockholm, Brussels, and Copenhagen, Corr. Inst. Fr., etc. etc. 16, Belgrave-square, S.W.; and 23, Jermyn-street, S.W.*

Year of Election.	
1864	Murchison, Capt. R. M. 120, *Ebury-street, Pimlico, S.W.*
1840	*Murdock, Thomas W. C., Esq. 8, *Park-street, Westminster, S.W.; and River-bank, Putney, S.W.*
1860	Murray, George J., Esq. *Parbrook-house, Cosham, Hants; and Junior Carlton Club, S.W.*
1868	*Murray, Henry, Esq. *Hong Kong. Care of Messrs. Jardine, Matheson, and Co., 3, Lombard-street, E.C.*
1844	1480*Murray, James, Esq. *Foreign Office, S.W.*
1850	Murray, John, Esq. 50, *Albemarle-street, W.; and Newstead, Wimbledon, S.W.*
1860	*Murray, Lt. W., 68th Beng. N. Inf., Topo. Assist. G. Trig. Survey. *Mussoorie, India. Messrs. H. S. King and Co.*
1865	Mussy, H. G. de, Esq., M.D. 4, *Cavendish-place, W.*
1865	Nairne, P. A., Esq. 2, *Grove-hill, Camberwell, S.*
1853	Napier, Maj.-General Geo. Thomas Conolly, C.B. *Jun. United Service Club, S.W. Care of Sir J. Kirkland.*
1868	Napier, of Magdala, Lord, G.C.B., F.R.S. 49, *Cleveland-square, S.W.*
1861	Napier, William, Esq.
1859	*Naumyth, Capt. David J., 1st Assist. Trigonometrical Survey. *Bhoof, Bombay; and 5, Charlotte-street, Edinburgh.*
1857	*Nesbitt, Henry, Esq. 12, *Victoria-villas, Kilburn, N.W.*
1869	1490Neville, Lieut.-Col. Edward. 30, *Clarges-street, Piccadilly, W.*
1868	Newbatt, Benjamin, Esq., F.R.S., *etc.* 7, *Vicarage-gardens, Campden-hill, W.*
1867	Newdigate, Lieut.-Col. Francis W. (Coldstream Guards). *Bytbley-lodge, Needwood Forest, Burton-upon-Trent.*
1856	Newman, Thomas Holdsworth, Esq. 43, *Green-street, Grosvenor-square, W.*
1868	Nicol, Geo. William, Esq. *Care of Messrs. Glyn, Mills, and Co., 67, Lombard-street, E.C.*
1860	Nicol, James D., Esq., M.P. 13, *Hyde-park-terrace, Cumberland-gate, W.*
1869	Nicol, Robert Esq. *Reform Club, S.W.; and Westminster-palace-hotel, S.W.*
1868	Nicol, William, Esq. 41, *Victoria-street, S.W.; and Fasnyde, Kennerf, Kincardine.*
1865	*Nichols, Robert C., Esq. 5, *Sussex-place, W.*
1856	Nicholson, Sir Charles, Bart., D.C.L., Chancellor of the University, Sydney. 26, *Devonshire-place, Portland-place, W.*
1830	1500Nicolson, Rear-Admiral Sir Frederick Wm. Erskine, Bart. 15, *William-street, Lowndes-square, S.W.*
1864	Nissen, H. A., Esq. *Mark-lane, E.C.*
1858	Nix, John H., Esq. 77, *Lombard-street, E.C.*
1861	Noel, the Hon. Baden. 11, *Chandos-street, Cavendish-square, W.; and Exton-hall, Oakham, Rutlandshire.*

Year of Election		
1857		*Nolloth, Captain Matthew S., R.N. 13, *North-terrace, Camberwell, S.E.; and United Service Club, S.W.*
1865		Norman, H. J., Esq. 106, *Fenchurch-street, E.C.*
1860		Norris, Harry, Esq. *Colonial Office, S.W.; and 4, Little St. James's-street, S.W.*
1861		North, Alfred, Esq. 20, *Royal York-crescent, Clifton, Bristol.*
1865		Northumberland, Algernon George, Duke of. *Northumberland-house, S.W.*
1862		Notman, Henry Wilkes, Esq. 7, *Great Marlborough-street, W.*
1862	1510	Nourse, Henry, Esq. *Conservative Club, S.W.*
1858		*Oakeley, R. Barnes, Esq. *Kilmaronaig, Inverary, Argyllshire, N.B.*
1867		O'Brien, James, Esq. 109, *Belgrave-road, Pimlico, S.W.; and Clare, Ireland.*
1856		O'Connor, Major-General Luke Smyth, C.B., late Governor of the Gambia. *U.S. Club, S.W.*
1858		Ogilvie, Edward D., Esq. *Fulyillar, Clarence-river, New South Wales. Care of Messrs. Marryat and Sons, Lawrence Pountney-lane, E.C.*
1863		Ogilvy, Col. Thos. 23, *Grafton-street, Piccadilly, W; and Ruthven, Forfarsh., N.B.*
1864		Ogilvy, Thos., Esq. 62, *Prince's-gate, Hyde-park, W.*
1851		Oldershaw, Capt. Robert Piggott. 74, *Warwick-square, Belgrave-road, S.W.*
1855		Oliphant, Laurence, Esq. *Athenæum Club, S.W.*
1866		Oliver, Lieut. S. P., 12th Brigade R.A. 1, *Buckingham-villas, Brockhurst-road, Gosport, Hants.*
1845	1520	*Ommanney, Admi. Erasmus, C.B., F.R.A.S. 6, *Talbot-square, Hyde-park, W.; and United Service Club, S.W.*
1858		*Ommanney, H. M., Esq. *Blackheath, S.E.*
1867		Ormathwaite, John Benn-Walsh, Lord. 28, *Berkeley-square, W.*
1853		Osborn, Sir George R., Bart. *Travellers' Club, S.W.; and Chicksand-priory, Beds.*
1856		Osborn, Capt. Sherard, R.N., C.B., Officier de Légion d'Honneur, etc. *Athenæum Club, S.W.; and 112, Gloucester-terrace, W.*
1861		Osborne, Lieut.-Col. Willoughby. *Political Agent, Bhopal, Sehira, India.*
1859		O'Shaughnessy, Richard, Esq. 12, *Cornwall-gardens, South Kensington, W.*
1852		Oswell, William Cotton, Esq.
1855		Otway, Arthur John, Esq., M.P. *Army and Navy Club, S.W.*
1860		*Outty-North, the Rev. J. *East Acton, Middlesex, W.*
1844	1530	*Overstone, Samuel, Lord, M.A., M.R.I. 2, *Carlton-gardens, S.W.; and Wickham-park, Surrey.*
1858		Owden, Thomas S. Esq. *Mount-pleasant, Philip-lane, Tottenham.*
1867		Owen, Capt. Chas. Lanyon (Adj. R. M. Light Inf., Portsmouth Division). *Glendower-lodge, Bury-road, Gosport.*

Year of Election	
1861	Page, Thomas, Esq., C.E., *F.G.S.* 3, *Adelphi-terrace, W.C.; and Tower Cressy, Aubrey-road, Bayswater, W.*
1853	Pakington, Right Hon. Sir John Somerset, Bart., M.P. 41, *Eaton-square, S.W.; and Westwood-park, Droitwich, Worcestershire.*
1868	Paliologus, William Thomas, Esq. *Care of Messrs. McGregor and Co.*, 17, *Charles-street, S.W.*
1855	Palmer, Major Edm., R.A. *Boxhill, Pennycross, Plymouth.*
1865	*Palmer, Commander George, R.N. *H.M.S. 'Bonetta,' Australia; and Cavers, Hawick, Roxburghshire, N.B.*
1862	Palmer, Rev. Jordan, M.A., *F.R.A.S.*, Chaplain to St. Ann's Royal Society. *Streatham, S.*
1838	*Palmer, Samuel, Esq.
1865	1540*Papengouth, Oswald C., Esq., C.E. 46, *Russell-square, W.C.*
1863	*Paris, H.R.H. Le Comte de. *Claremont.*
1864	Parish, Capt. A. *Chiswick, Kent.*
1849	*Parish, Capt. John E., R.N. *Army and Navy Club, S.W. Care of Messrs. Stilwell.*
1833	*Parish, Sir Woodbine, K.C.H., *F.R.S.*, &c. *Quarry-house, St. Leonard's-on-Sea.*
1866	Parker, Capt. Francis G. S., *F.G.S.*, A.I.C.E. *Barracks, Belfast.*
1862	Parker, Robert Deane, Esq. *Union Club, S.W.; and Barham, Canterbury.*
1850	Parkes, Sir Harry S., C.B., &c. *Oriental Club, W.; and Athenæum Club, S.W.*
1850	*Parkyns, Mansfield, Esq., *F.Z.S.* *Arthur's Club, St. James's-street, S.W.; and Woodborough-hall, Southwell.*
1859	Pasteur, Marc Henry, Esq. 38, *Mincing-lane, E.C.*
1867	1550Paterson, John, Esq. 19A *Coleman-street, City, E.C.*
1857	Paton, Andrew A., Esq. *H.B.M.'s V.-Consul, Mitylene, Greece.*
1863	Pattinson, J., Esq. 21, *Broad-street, E.C.*
1868	Paul, J. H., Esq., M.D. *Camberwell-house, Camberwell, S.*
1858	Paul, Joseph, Esq. *Ormonde-house, Ryde, Isle of Wight.*
1865	Payne, Captain J. Bertrand, M.R.I., *F.R.S.L.*, Mem. Geograph. Soc. of France. *Conservative Club, S.W.; Royal Thames Yacht Club, W.; and Timsford-house, The Grange, Brompton, W.*
1847	*Payster, William, Esq., *F.R.A.S.* 21, *Belgrave-square, S.W.; and Camberwell-house, Richmond, Surrey, S.W.*
1853	Peacock, George, Esq. *Starcross, near Exeter.*
1863	Pearse, Capt. E. B., R.N. *Arthur's Club. Care of Messrs. Woodhead.*
1863	Pearson, Fred., Esq. 13, *Cleveland-square, W.*
1853	1560*Peckover, Alexander, Esq. *Wisbeach.*
1860	*Peek, Henry William, Esq., M.P. *Wimbledon-house, S.W.*
1861	Peel, Archibald, Esq. *The Gerwyn, Wrexham, N. Wales.*
1858	Peel, Sir Robert, Bart., M.P. 4, *Whitehall-gardens, S.W.; and Drayton-manor, Tamworth.*
1868	*Pender, John, Esq. 18, *Arlington-street, W.*
1863	*Pennant, Col. S. S. Douglas. *Penrhyn-castle, Bangor, N.B.*
1859	*Penrhyn, Lord. *Penrhyn-castle, Bangor.*
1853	Percy, Major-General the Hon. Lord Henry M. (Guards). 40, *Eaton-square, S.W.*

Year of Election		
1865		Pereira, Francisco E., Esq. *Care of Messrs. Richardson*, 18, *Pall-mall.*
1860		Perkins, Frederick, Esq. *Mayor of Southampton.*
1865	1570	Perkins, William, Esq. *Rosario, Argentine Republic. Care of W. Bollaert, Esq.*
1859		Perry, Sir Erskine, Member Indian Council. 36, *Eaton-place, S.W.*
1865		Perry, Gerald R. Esq., British Consulate, Stockholm. *Care of E. Hertslet, Esq., Foreign-office, S.W.*
1859		Perry, William, Esq., H.B.M.'s Consul, Panama. *Athenæum Club, S.W.*
1862		*Perry, William, Esq. 9, *Warwick-road, Upper Clapton, N.E.*
1862		Peter, John, Esq.
1857		*Peters, William, Esq. 35, *Nicholas-lane, Lombard-street, E.C.*
1860		*Petherick, John, Esq. *Henley-on-Thames.*
1858		Peto, Sir S. Morton, Bart. 12, *Kensington-palace-gardens, W.*
1861		Petrie, Alexander S., Esq. 4, *St. Mark's-square, N.W.*
1860	1580	Petrie, Major Martin, 97th Regiment. *Honorary-lodge, Kensington-park, W.*
1866		Phaysayn, Robert, Esq. *Wellington, New Zealand. Care of Messrs. Scales and Rogers*, 24, *Mark-lane, E.C.*
1867		Phayre, Col. Sir Arthur. *East India United Service Club, S.W.*
1854		Phelps, William, Esq. 18, *Montagu-place, Russell-square, W.C.*
1862		Phené, John Samuel, Esq., F.G.S. 5, *Carlton-terrace, Oakley-street, S.W.*
1860		Philip, George, Esq. 32, *Fleet-street, E.C.*
1865		Phillipps, Edward B., Esq. 103, *Onslow-square, S.W.*
1857		Phillimore, Capt. Augustus, R.N. 25, *Upper Berkeley-st., W.; and U.S. Club, S.W.*
1859		Phillimore, Chas. Bagot, Esq. *India Office, S.W.; and* 25, *Upper Berkeley-st., W.*
1860		Phillimore, Wm. Brough, Esq., late Capt. Grenadier Guards. 5, *John-street, Berkeley-square, W.*
1854		Phillips, Major-General Sir B. Truvell. *United Service Club, S.W.*
1869		Phillips, Edward Augustus, Esq. 19, *Elgin-road, Maida-vale, W.*
1830	1590	*Phillipps, Sir Thomas, Bart., M.A., F.R.S., F.S.A. *Middle-hill, Broadway, Worcestershire.*
1856		Phillips, John, Esq., Solicitor. *Hastings.*
1867		Pierce, Charles A., Esq. *South Kensington Museum, W.*
1869		Piggot, John, jun., Esq., F.S.A., &c. *The Elms, Ulting, Maldon, Essex.*
1864		*Pigou, F. A. P., Esq. *Dartford, Kent.*
1865		Pigou, Rev. F., M.A. 14, *Suffolk-street, Pall-mall-east, S.W.*
1861		Pike, Frederick, Esq. 44, *Charing-cross, S.W.*
1852		*Pike, Captain John W., R.N. *United Service Club, S.W.*
1865	1600	Pilkington, James, Esq. *Blackburn.*
1865		Pilkington, William, Esq. *War-office.*
1852		*Pim, Capt. Bedford C. T., R.N. *Belsize-square, Hampstead, N.W.; and Senior and Junior United Service Club, S.W.*
1858		Pinsett, James, Esq. *Telham-house-school, Brixton-hill, S.*
1859		Pinney, Colonel William. 30, *Berkeley-square, W.*

Year of Election.

1867 Plant, Nathaniel, Esq. *Hôtel Exchange, Rio de Janeiro; and De Montfort-house, Leicester.*

1865 Player, John, Esq. 24, *Duchess-road, Edgbaston, Birmingham.*

1860 Playfair, Lieut.-Col. Robert Lambert. H.B.M. Consul-General, Algiers. *Care of E. Hertslet, Esq., Foreign-office.*

1866 Plowden, Charles, C., Esq. *Belgrave-mansions, Grosvenor-gardens, S.W.*

1856 *Plowes, John Henry, Esq. 39, *York-terrace, Regent's-park, N.W.*

1855 1610*Pollexfen, Capt. J. H. *India.*

1866 *Pollington, Jno. Horace, Viscount. 33, *Dover-street, W.*

1853 Pollock, General Sir George, G.C.B. *Clapham-common, Surrey, S.*

1835 *Ponsonby, Hon. Frederick G. B. 3, *Mount-street, Grosvenor-square, W.*

1860 Pook, Captain John. 6, *Colfe's-villas, Lewisham-hill, S.E.*

1857 Pope, Captain Wm. Agnew. 12, *Stanhope-place, Hyde-park, W.*

1862 *Porcher, Captain Edwin A., R.N. 3, *Montagu-square, W.*

1853 Porter, Edwd., Esq. *Athenæum Club, S.W.; and 26, Suffolk-street, Pall-mall, S.W.*

1864 Portugal, Chev. Joaquim de.

1868 Potter, Archibald Gilchrist, Esq. *Woodham-lodge, Lavender-hill, Wandsworth, S.W.*

1867 1610Potter, Wm. Henry, Esq. *Dunsden-lodge, Sonning, near Reading.*

1861 *Poundes, Captain Lonsdale. *Junior United Service Club, S.W.; and Rowans-wood, Co. Wexford.*

1862 Povah, Rev. John V., M.A. 11, *Endsleigh-street, W.C.*

1864 *Powell, F. S., Esq. 1, *Cambridge-square, Hyde-park, W.*

1859 Power, E. Rowdon, Esq. Retired List, Ceylon Civil Service. *Heywood-lodge, Tenby, South Wales; and Thatched House Club, S.W.*

1854 Power, John, Esq. 3, *College-terrace, Cambridge-road, Hammersmith, W.*

1854 Power, John Arthur, Esq., M.A., B.M. 52, *Burton-crescent, W.C.*

1868 Pownall, John Fisher, Esq. 65, *Russell-square, W.C.*

1864 Powys, the Hon. C. J. F.

1864 Powys, the Hon. E. R.

1864 1630Powys, Hon. Leopold. 17, *Montagu-street, Portman-square, W.*

1868 Price, Charles S., Esq. *Bryn Derwen, Neath.*

1869 Price, F. G. H., Esq. 12, *Upper Berkeley-street, Portman-square, W.*

1852 Price, James Glenie, Esq., Barrister-at-Law. 14, *Clement's-inn, W.C.*

1869 Prichard, Illtudus Thomas, Esq. 29, *Granville-park, Blackheath, S.E.*

1860 *Prickett, Rev. Thomas William, M.A., F.S.A.

1868 Prideaux, W., F. Esq., Bombay Staff Corps. 15, *Avenue-road, Regent's-pk., N.W.*

1865 *Pringle, A., Esq. *Yair, Selkirk, N.B.*

1853 *Pringle, Thomas Young, Esq. *Reform Club, S.W.*

1866 *Prinsep, Edw. Aug., Esq., B.C.S., Commissioner of Settlements in the Punjab. *Umritsar. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*

1868 1640Pritchard, Lieut.-Col. Gordon Douglas. *Chatham.*

Year of Election.	
1868	Pryce, James E. Coulthurst, Esq. *Conservator of the Port of Bombay.*
1861	*Prodgers, Rev. Elwin. *The Rectory, Ayott St. Peter's, Herts.*
1852	Prout, John William, Esq., M.A., Barrister-at-Law. *Athenæum Club, S.W.; and Neasden, Middlesex, N.W.*
1862	*Puget, Major J., 8th Hussars. *Dundalk, Ireland.*
1860	Puller, Arthur Giles, Esq. *Athenæum Club, S.W.; Arthur's Club, S.W.; and Fennycbury, Ware.*
1857	Purcell, Edward, Esq., LL.D. 2, *Maze-hill, Greenwich, S.E.*
1869	Purdon, Lieut. George Frederic, R.N. *Woodlands, Bracknell, Berks.*
1865	*Pusey, Sidney E. Bouverie, Esq. 7, *Green-street, Grosvenor-square, W.*
1867	Quin, Francis Beaufort Wyndham, Esq. *Watmaswick-house, near Market Drayton, Salop.*
1861	1650Quin, Lord George. 15, *Belgrave-square, S.W.*
1862	Quin, John Thos., Esq. *Care of Mr. Lambton, Epsom.*
1854	*Quin, Admiral Michael. *Senior United Service Club, S.W.;* and 18, *Albion-villas, Albion-road, Islington, N.*
1868	Quin, T. Francis, Esq. 9, *Grafton-square, Clapham, S.*
1858	*Radstock, Granville Augustus, Lord. 30, *Bryanston-square, W.*
1869	Rae, Edward, Esq. *Claughton, near Birkenhead.*
1862	*Rae, James, Esq. 32, *Phillimore-gardens, Kensington, W.*
1853	Rae, John, Esq., M.D. 2, *Addison-gardens south, Holland-villas-road, Kensington, W.*
1867	Raleigh, Rev. A., D.D. *Arran-house, Highbury-new-park.*
1866	Ramsay, Alex., Jun., Esq. 45, *Norland-square, Notting-hill, W.*
1866	1660*Ramsay, Admiral G. *United Service Club, S.W.*
1867	Ramsay, John, Esq. *Islay, N.B.*
1851	*Ramsay, Rear-Admiral Wm., C.B., F.R.A.S. *Junior United Service Club, S.W.; and 23, Ainslie-place, Edinburgh.*
1867	*Ransden, Richard, Esq., D.A. *Camp-hill, Nuneaton, Warwickshire.*
1869	Randell, Thomas, Esq. *St. Mark's College, Chelsea, S.W.*
1868	Rankin, William, Esq. *Tiermalogue, Carndonagh, Donegal.*
1866	Ransom, Edwin, Esq. *Kempstone, near Bedford.*
1869	Rassam, Hormuzd, Esq., Assistant Political Resident, Aden. *Care of Messrs. King and Co., 45, Pall-mall, S.W.*
1859	Ratcliff, Charles, Esq., F.R.A. *National Club, S.W.; Edgbaston, Birmingham; and Downing College, Cambridge.*

Year of Election.	
1861	Rate, Lachlan Macintosh, Esq. 9, *South Audley-street, W.*
1846	1670Ravenshaw, E. C., Esq., M.R.A.S. *Oriental Club, W.; and 36, Eaton-sq., W.*
1859	Ravenstein, Ernest G., Esq. *Topographical Depôt, Spring-gardens, S.W.*
1861	Rawlinson, Sir Christopher. *Hun-court, Upton-on-Severn. United University Club, S.W.*
1844	*Rawlinson, Maj.-General Sir Henry C., K.C.B., D.C.L., F.R.S. *Athenæum Club, S.W.; and 21, Charles-street, Berkeley-square, W.*
1838	Rawson, His Excellency Rawson Wm., C.B., Colonial Secretary. *Barbadoes.*
1869	Ray, Capt. Alfred William. *The Lodge, Brixton-road, S.*
1860	Ray, W. H., Esq. *Thorn-house, Ealing.*
1859	Read, Col. William Fitzwilliam. *Junior United Service Club, S.W.*
1863	Reade, W. Winwoode, Esq. *Conservative Club.*
1865	Redhead, R. Milne, Esq. *Springfield, Sedley, Manchester; Conservative Club, S.W.; and Junior Carlton Club, S.W.*
1868	1680*Redman, John, B., Esq., C.E. 6, *Westminster-chambers, Victoria-street, S.W.*
1861	*Reid, David, Esq. 95, *Piccadilly, W.*
1858	Rees, L. E. R., Esq. 3, *East India-avenue, E.C.*
1859	Reeve, John, Esq. *Conservative Club, S.W.*
1866	*Rehlen, George, Esq. 9, *Great Tower-street, E.C.*
1856	Reid, Henry Stewart, Esq., Bengal Civil Service.
1857	Reid, Lestock R., Esq. *Athenæum Club, S.W.; and 122, Westbourne-ter., W.*
1861	Reilly, Anthony Adams, Esq. *Belmont, Mullingar.*
1869	*Reiss, James, Esq. 7, *Cromwell-road-houses, South Kensington, W.*
1830	*Rennie, Sir John, C.E., F.R.S., F.S.A. 7, *Lowndes-square, S.W.*
1860	1690*Rennie, John Keith, Esq., M.A. Camb. 56, *Gloucester-terrace, Hyde-park, W.*
1834	*Rennie, M. B., Esq., C.E. *Care of James Rennie, Esq.*, 9, *Molcomb-street, Belgrave-square, S.W.*
1864	Rennie, W., Esq. 14, *Hyde-park-square, W.*
1830	*Renwick, Lieutenant, R.E.
1861	Reuter, Julius, Esq. 1, *Royal Exchange-buildings, E.C.*
1858	Reynardson, Henry Birch, Esq. *Adwell, near Tetsworth, Oxfordshire.*
1867	Rhodes, Arthur John, Esq. 24, *Kidbrooke-park-road, Blackheath, S.E.*
1865	Richards, Alfred, Esq. *Lamb's-buildings, Temple, E.C.*
1857	Richards, Capt. George H., R.N., F.R.S. *Admiralty, Whitehall, S.W.; and 12, Westbourne-terrace-road, W.*
1860	Richards, the Rev. George, D.D.
1864	1700Richardson, F., Esq. *Park-lodge, Blackheath-park, S.E.*
1859	Richards, Edward Henry, Esq. 4, *Connaught-place, Hyde-park, W.*
1865	*Richout, W. J., Esq. 51, *Charles-street, Berkeley-square, W.*
1864	Ridley, F. H., Esq. 11, *Mortimer-road, Kilburn, W.*
1864	Ridley, George, Esq. 2, *Charles-street, Berkeley-square, W.*
1862	*Rigby, Major-General Christopher Palmer. *Oriental Club, W.; and 14, Mansfield-street, W.*

Year of Election		
1862		Rigby, Joseph D., Esq. *Esher, Surrey; and Kew-green, Surrey, W.*
1858		Riley, Capt. Charles Henry. *Junior United Service Club, S.W.*
1850		Rintoul, Robert, Esq. *Windham Club, S.W.*
1830		*Robe, Maj.-General Fred. Holt, C.B. *United Service Club, S.W.; and* 10, *Palace-gardens-terrace, Kensington, W.*
1868	1710	Roberts, Charles W., Esq. *Penrith-house, Effra-road, Brixton, S.*
1861		Roberts, Capt. E. Wynne. *Junior Carlton Club, S.W.; and* 18, *Great Cumberland-street, Hyde-park, W.*
1865		Robertson, A. Stuart, Esq., M.D. *Horwich, near Bolton.*
1860		Robertson, D. Brooke, Esq., H.B.M.'s Consul. *Canton. H. S. King and Co.*
1861		*Robertson, Graham Moore, Esq. 21, *Cleveland-square, Hyde-park, W.*
1868		Robertson, Rev. J. S. S., M.A., F.R.A.S. *Duncrub-castle, Duncrub-park, Dunning, Perthshire, N.B.*
1863		Robertson, R. B., Esq. *H.M.'s Legation, Yokohama, Japan. Care of Capt. Brown, R.N.*, 10, *Portland-terrace, Southsea, Hants.*
1830		*Robinson, Rear-Admiral Charles G. 12, *Warwick-road, Maida-hill, W.*
1859		Robinson, Lieut.-Col. D. G., R.E., Director-Gen. of Telegraphs in India. *Calcutta.*
1864		Robinson, H. O., Esq.
1859	1720	Robinson, Sir Hercules G. R. *Governor of Ceylon. Messrs. Burnett*, 17, *Surrey-street, S.W.*
1865		Robinson, J. R., Esq., LL.D., F.S.A. Scot., LL.D., F.R.S.A. du Nord, Copenhagen, F.G.S., Edin. Membre Société Asiatique de Paris, &c. *South-terrace, Dewsbury.*
1860		Robinson, Mr. Serjeant. 8, *King's-Bench-walk, Temple, E.C.; and* 43, *Mecklenburgh-square, W.C.*
1862		Robinson, Lieut.-Col. Sir John Stephen, Bart. *Arthur's Club, S.W.; and* 16A, *Park-lane, W.*
1864		Robinson, John, Esq. *Care of E. Street, Esq.*, 30, *Cornhill, E.C.*
1855		Robinson, Thomas F., Esq., F.L.S. 9, *Derwind-road, South Penge-park, Anerley, S.*
1850		*Robinson, Capt. Walter F., R.N. 13, *Montpellier-villas, Brighton.*
1830		*Rodd, James Rennell, Esq. 20, *Beaufort-gardens, W.*
1860		Roe, Capt. Jno. Septimus, Surveyor-General, W. Australia. *Messrs. Stilwell, Arundel-street, Strand, W.C.*
1863		Rogers, John T., Esq. 58, *Eccleston-square, S.W.*
1861	1730	Rollo, Lord. *Duncrieff-castle, Moffat, N.B.*
1863		Röss, M. Herman von. 21, *Kensington-park-gardens, W.*
1866		Rooke, Capt. W., R.A. *Formosa, Lymington, Hants.*
1860		Ross, Gustaf, Esq.
1854		*Ross, the Right Hon. Sir George, F.R.S., LL.D. 4, *Hyde-park-gardens, W., and* 25, *Southampton-buildings, Chancery-lane, W.C.*
1858		Ross, Henry, Esq. 8, *Powlett-square, Hyde-park, N.W.*
1861		Ross, Jas. Anderson, Esq. *Wandsworth, Surrey, S.W.; and* 11, *Salisbury-street, W.C*

Year of Election.

1857 *Rose, Wm. A., Esq., Alderman. 63, *Upper Thames-street, E.C.*; and *Bedons, Cranford.*

1864 Ross, B. R., Esq. *Care of the Hudson-bay Company, Hudson-bay-house*, 1, *Lime-street, E.C.*

1863 Ross, Wm. Andrew, Esq. 7, *Albemarle-street, W.*

1867 1740Rossiter, Wm., Esq., F.R.A.S. *South London Working Men's College*, 21, *Blackfriars-road, S.E.*

1868 Ross-Johnson, H. C., Esq. 7, *Albemarle-street, W.*

1864 *Roundell, C. S., Esq. 44, *Piccadilly, W.*

1862 Roupell, Robert Priolo, Esq., M.A., Q.C. 45, *Albany, W.*

1839 *Rous, Vice-Admiral the Hon. Henry John. 13, *Berkeley-square, W.*

1864 Routh, E. J., Esq. *St. Peter's College, Cambridge.*

1862 Rowe, Sir Joshua, C.B., late Chief Justice of Jamaica. 10, *Queen Anne-street, Cavendish-square, W.*

1868 *Rowlands, Percy J., Esq. *India-office, S.W.*; 24, *Notting-hill-terrace, W.*

1863 Rowley, Capt. C., R.N. 35, *Cadogan-place, S.W.*

1856 Rucker, J. Anthony, Esq. *Blackheath, S.E.*

1861 1750*Rumbold, Charles James Augustus, Esq. *Downing College, Cambridge*; and 5, *Percival-terrace, Brighton.*

1861 Rumbold, Thomas Henry, Esq.

1860 Rumley, Major-General Randall, Vice-President Council of Military Education. 12, *Cadogan-place, S.W.*

1858 *Russell, Arthur John Edward, Esq., M.P. 2, *Audley-square, W.*

1869 Russell, George, Esq., M.A. *Viewfield, Southfields, Wandsworth*; and 16, *Old Change, St. Paul's, E.C.*

1830 *Russell, Jesse Watts, Esq., D.C.L., F.R.S.

1830 Russell, John, Earl, F.R.S. 37, *Chesham-place, S.W.*; *Pembroke-lodge, Richmond, S.W.*; *Endsleigh-ho., Devon*; and *Gart-ho., near Callander, N.B.*

1860 Russell, Wm. Howard, Esq., LL.D.

1860 Rutherford, John, Esq. 2, *Cavendish-place, Cavendish-square, W.*

1857 *Ryder, Admiral, Alfred P. *U.S. Club, S.W.*; and *Lamels-abbey, Uppingham.*

1864 1760Ryder, G., Esq. 10, *King's-Bench-walk, Temple, E.C.*

1869 Rylands, Peter, Esq. *Bewsey-house, Warrington.*

1868 Sabben, J. T., Esq., M.D., *Northumberland-house, Stoke Newington, N.*

1852 Sabine, Lieut.-General Sir Edw., K.C.B., G.A., Pres. R.S., F.R.A.S., &c. &c. 15, *Ashley-place, Victoria-street, Westminster, S.W.*; and *Woolwich, S.E.*

1847 St. Asaph, Rt. Rev. Thos. Vowler Short, Bishop of. *Palace, St. Asaph, N. Wales.*

1869 St. Clair, Alexander Bower, Esq., H.B.M. Consul, Jassy, Moldavia. *Care of E. Hertslet, Esq., Foreign-office, S.W.*

1857 St. David's, Connop Thirlwall, Bishop of. *Abergwilly-palace, Carmarthen.*

1867 St. John, Lieut. Oliver Beauchamp Coventry, R.E. *National Club, S.W.*

1863 St. John, R. H. St. Andrew, Esq., 60th Rifles.

Year of Election.	
1862	St. John, Spenser, Esq., Chargé d'Affaires, Port-au-Prince, Haiti. 25, *Grove-end-road, St. John's-wood, N.W.*
1863	1770Sale, Lieut. M. T., R.E. *The Crescent, Rugby; and Cherrapoonjee, Bengal.*
1867	Salkeld, Colonel J. C. (H.M.I. Forces). 29, *St. James's-street, S.W.*
1868	Salles, J. de, Esq. *Belgrave-mansions, Grosvenor-gardens.*
1869	*Salmond, Robert, Esq. *Reform Club, S.W.; 14, Woodside-crescent, Glasgow; and Rankeaton, Potter, Ayr.*
1845	*Salomons, Alderman Sir David, Bart., M.P., F.R.S., F.R.A.S. 26, *Great Cumberland-place, Hyde-park, W.; and Broom-hill, near Tunbridge-wells.*
1863	*Salt, Henry, Esq. 29, *Gordon-square, W.C.*
1861	Salting, William Severin, Esq. 60, *St. James's-street, S.W.*
1861	*Sandbach, Wm. Robertson, Esq. 10, *Prince's-gate, Hyde-park, S.W.*
1867	Sanderman, David George, Esq., *Cambridge-house, Piccadilly, W.*
1862	Sanford, Major Henry Aylsford. 29, *Chester-street, Grosvenor-place, W.; and Nynehead-court, Wellington, Somerset.*
1860	1760Sarel, Lieut.-Colonel H. A., 17th Lancers. *Army and Navy Club, S.W.; and Shanghae.*
1862	Sargood, F. J., Esq. *Moorgate-street-buildings, E.C.*
1869	Sarll, John, Esq. *Englefield-house, Dr Beauvoir-town, N.*
1860	Sartoris, Alfred, Esq. *Abbotswood, Stow-on-the-Wold.*
1852	Saumarez, Captain Thomas, R.N. *The Firs, Jersey.*
1866	Saunders, James Ebenezer, Esq., F.L.S., F.G.S., F.R.A.S. 9, *Finsbury-circus; and Granville-park, Blackheath, S.E.*
1864	Saurin, Admiral E. *Prince's-gate, S.W.*
1863	Sawyer, Col. Charles, 6th Dragoon Guards. 50, *Sussex-square, Kemp-town, Brighton.*
1838	Scarlett, Lieut.-General the Hon. Sir J. Yorke, K.C.B. *Portsmouth.*
1861	Scharley, Edward W. H., Esq. 14, *Prince's-gate, S.W.*
1866	1790Scott, Adam, Esq. 10, *North-street, Finsbury, E.C.*
1866	Scott, Arthur, Esq. *Travellers' Club, S.W.*
1858	Scott, Lord Henry. 3, *Tilney-street, Park-lane, W.*
1861	*Scott, Hercules, Esq. *Brotherton, near Montrose, N.B.*
1855	Scott, Admiral Sir James, K.C.B. *United Service Club, S.W.*
1866	Scott, John, Esq., M.D.
1868	Scott, William Cumin, Esq. *Mayfield-house, Blackheath-park.*
1863	Scovell, George, Esq. 34, *Grosvenor-place, S.W.*
1861	Seawright, James, Esq. 80, *Lancaster-gate, W.*
1869	Searle, Frank Furlong, Esq., M.R.C.S., &c. 20, *Cathedral-yard, Exeter.*
1867	1800Seaton, Col. the Right Hon. Lord. D 3, *Albany, W.*
1864	Seaton, Joseph, Esq., M.D. *Hallifford-house, Sunbury, Middlesex, S.W.*
1830	*Sedgwick, the Rev. A., Woodwardian Lecturer, M.A., F.R.S. *Athenæum Club, S.W.; and Cambridge.*
1869	Sedgwick, John Bell, Esq. 1, *St. Andrew's-square, Regent's-park, N.W.*
1862	Seemann, Berthold, Esq., PH. DR., F.L.S. 57, *Woodsome-road, Holloway, N.*

Year of Election	
1866	Sendall, Walter T., Esq., Inspector of Schools in Ceylon. *Colombo; and Civil Service Club, S.W.*
1865	Semmbe, Edwin, Esq. 49, *Brook-street, Grosvenor-square, W.*
1858	*Sercold, Charles P., Esq. *Brewery, Liquorpond-street, E.C.*
1853	Serin, Charles, Esq. 155, *Fenchurch-street, E.C.*
1867	Seymour, Alfred, Esq., M.P. 47, *Eaton-square, S.W.*
1858	1810Seymour, George, Esq. 54, *Lime-street, E.C.*
1855	Seymour, Admiral Sir Geo. F., K.C.B., G.C.H. 115, *Eaton-square, S.W.*
1853	*Seymour, Henry Danby, Esq. 39, *Upper Grosvenor-street, W.; Knoyle-Hindon, Wilts; and Glastonbury, Somersetshire.*
1854	*Shadwell, Admiral Charles F. A., C.B. *Meadow-bank, Melksham, Wilts.*
1860	*Shadwell, Lieut.-Colonel Lawrence. 9, *Queensberry-place, Cromwell-road, Kensington, W.*
1856	*Share, Staff Commander James Masters, R.N. *The Willows, Wyke Regis, Weymouth, Dorset.*
1866	Sharp, Henry T., Esq. 102, *Piccadilly, W.*
1861	Sharp, Peter, Esq. *Oakfield, Ealing, W.*
1861	*Sharpe, William John, Esq. 1, *Victoria-street, Westminster, S.W.; and Norwood, Surrey, S.*
1862	*Shaw, John, Esq. *Fineyard, Otago, New Zealand.*
1861	1810Shaw, John Ralph, Esq. *Arrosee-park, Birkenhead.*
1858	Shea, John, Esq., M.D., Surgeon R.N. 84, *Blackfriars-road, S.*
1846	Sheffield, George A. F. C., Earl of. 20, *Portland-place, W.; and Sheffield-park, Sussex.*
1857	Sheil, Major-Gen. Sir Justin, K.C.B. 13, *Eaton-place, Belgrave-square, S.W.*
1868	*Shelley, Capt. G. Ernest. 32, *Chesham-place, W.*
1861	Shepherd, Chas. Douglas, Esq., Surg. R.N. *H.M.S. 'Valiant,' Foynes, County Limerick.*
1867	Shepherd, Chas. Wm., Esq., M.A., F.R.S. *Trottescliffe, Maidstone.*
1860	Sheridan, H. Brinsley, Esq. *Rellefield-house, Parson's-green, Fulham, S.W.*
1863	Sheridan, Richd. B., Esq., M.P. 48, *Grosvenor-place, S.W.*
1857	Sherrin, Joseph Samuel, Esq., LL.D., PH. DR. *Leyton-house, Leyton-crescent, Kentish-town, N.W.*
1859	1830*Sherwill, Lieut.-Col. W. S., F.G.S. *Professor of Surveying, Civil Engineers' College, Calcutta; and Perth, N.B.*
1858	*Shipley, Conway M., Esq. *Twyford Moors, Winchester; and Army and Navy Club, S.W.*
1868	Shirley, Lionel H., Esq., C.E., &c. *Raleigh Club; and The Lygistte, Cheltenham.*
1866	Sholl, Charles, Esq., C.E.
1856	Shuttleworth, Sir J. P. Kay, Bart. 38, *Gloucester-square, W.; and Gawthorp-hall, Burnley, Lancashire.*
1865	*Silva, Frederic, Esq. 12, *Cleveland-square, Bayswater, W.*
1859	Silver, the Rev. Fred., M.A., F.R.A.S. *Norton-rectory, Market Drayton, Salop.*
1859	*Silver, Stephen Wm., Esq. 66, *Cornhill, E.C.; and Norwood-lodge, Lower Norwood, S.*

Year of Election	
1860	Sim, John Coygame, Esq. 13, *James-street, Buckingham-gate, S.W.*
1853	Simmons, Edward R., Esq., Barrister-at-Law. 4, *Hyde-park-gate, S.W.*
1848	1840*Simmons, Major-General Sir John L. A., K.C.B., K.C.B. *Lieut.-Governor Royal Military Academy, Woolwich, S.E.*
1866	Simons, Henry M., Esq. *Tyersall-crescent, Wood-road, Sydenham-hill, S.E.*
1864	Simpson, Frank, Esq. 17, *Whitehall-place, S.W.*
1862	Simpson, Henry Bridgeman, Esq. 44, *Upper Grosvenor-street, W.*
1863	*Simpson, Wm., Esq. 64, *Lincoln's-inn-fields, W.C.*
1866	*Sims, Richard Proctor, Esq., C.E. *Malabar-hill, Bombay. Care of Messrs. King and Co.*
1858	Skelmersdale, Edward, Lord. *Latham-park, Ormskirk, Lancashire.*
1866	Skinner, John E. H., Esq. 3, *Dr. Johnson's-buildings, Temple, E.C.*
1863	Skrine, Hy. D., Esq. *Warleigh-manor, near Bath.*
1861	Sladen, Rev. Edward Henry Mainwaring. *Alton, near Marlborough, Wilts.*
1861	1850Sligo, G. J. Browne, Marquis of. 14, *Mansfield-street, W.; and Westport, County Mayo.*
1865	Smedley, Joseph V., Esq., M.A. *Oxford and Cambridge Club, S.W.*
1860	*Smith, Augustus Henry, Esq. *Flexford-house, Guildford.*
1857	*Smith-Bosanquet, Horace, Esq. *Broxbourne-borough, Hoddesdon.*
1866	Smith, Drummond Spencer-, Esq. 7, *Mount-street, Berkeley-square, W.*
1859	Smith, Edward, Esq. *Windham Club, S.W.*
1867	Smith, Frederick, Esq. *The Priory, Dudley.*
1853	Smith, George, Esq. *Endless-house, Upper Norwood, S.*
1857	Smith, George R., Esq. 73, *Eaton-square, S.W.; and Tulse-park, Surrey.*
1865	Smith, Guilford, Esq. 83, *Charing-cross, S.W.*
1861	1860Smith, Jervoise, Esq. 47, *Belgrave-square, S.W*
1853	Smith, John Harrison, Esq. 55, *Chepstow-place, Bayswater, W.*
1852	Smith, John Henry, Esq. 1, *Lombard-street, E.C.; and Purley, Croydon, Surrey.*
1861	Smith, J. Sidney, Esq., Barrister-at-Law. *Sidney-lodge, Wimbledon-common, S.W.*
1861	*Smith, Joseph Torrens, Esq. 25, *Throgmorton-street, E.C.*
1838	*Smith, Octavius Henry, Esq. *Thames-bank, Westminster, S.W.*
1868	*Smith, Major Robert M., R.E., Director of the Telegraphic Establishment in Persia, Teheran. *Care of the Foreign-office, S.W.*
1857	Smith, Captain Philip, Grenadier Guards.
1841	*Smith, Thomas, Esq.
1859	*Smith, W. Castle, Esq. 1, *Gloucester-terrace, Regent's-park, N.W.*
1857	1870Smith, Wm. Gregory, Esq. *Hudson-bay Company, Fenchurch-street, E.C.*
1859	Smith, William Henry, Esq., M.P. 1, *Hyde-park-street, W.*
1869	Smyth, Colonel Edmund. *Elkington-hall, Wetton-hill, Lincolnshire.*
1869	*Smyth, Warrington, Esq., F.R.S. 92, *Inverness-terrace, W.*
1837	*Smyth, Rear-Adm. William. *Care of Messrs. Child and Co., Temple-bar.*
1850	*Smythe, Colonel William J., R.A.

Year of Election.	
1863	Snowden, Francis, Esq., M.A. 1, *Dr. Johnson's-buildings, Temple, E.C.*
1885	Solomons, Hon. Geo. *Craven Hotel, W.C.; and Jamaica.*
1839	*Somers, Charles, Earl. 33, *Prince's-gate, S.W.; Eastnor-castle, Herefordshire; and The Priory, Reigate, Surrey.*
1862	Somerset, Capt. Leveson E. H., R.N. *Care of Messrs. Chard, 3, Clifford's-inn, Fleet-street, E.C.*
1858	1885*Somes, Joseph, Esq. *Burntwood-lodge, Wandsworth-common, S.W.*
1855	Sopwith, Thos., Esq., M.A., C.E., F.R.S. 103, *Victoria-street, Westminster, S.W.*
1845	*Sotheby, Lt.-Col. Fred. S., C.B., F.R.A.S. 100, *Park-lane, W.*
1861	South, John Flint, Esq. *Blackheath-park, S.E.*
1880	*Southey, Jas. Lowther, Esq. *Care of Messrs. Stilwell.*
1869	Southwell, Thomas Arthur Joseph, Viscount. *Windham Club, S.W.*
1865	Spalding, Samuel, Esq. 7, *Upper Park-road, South Hampstead.*
1850	*Spencer-Bell, James, Esq. 1, *Devonshire-place, Portland-place, W.*
1867	Spicer, Edward, Esq. *Woodside, Muswell-hill, N.*
1863	Spickernell, Dr. Geo. E., Principal of Eastman's Royal Naval Establishment. *Eastern-parade, Southsea.*
1853	1890*Spottiswoode, William, Esq., F.R.S. 30, *Grosvenor-place, S.W.*
1859	*Spratt, Capt. Thos. A. B., R.N., C.B. *Clare-lodge, Nevill-park, Tunbridge-wells, Kent.*
1866	Spruce, Richard, Esq., PH. DR. *Welburn, Castle Howard, York.*
1859	Stafford, Edward W., Esq. *Colonial Secretary of New Zealand; care of Mr. J. S. Tytler, 19, Castle-street, Edinburgh.*
1868	Staley, Dr. Thomas (Bishop of Honolulu). *Upper Gore, Kensington; and Honolulu, Hawaiian Islands.*
1853	Stanford, Edward, Esq. 6, *Charing-cross, S.W.*
1853	Stanhope, Philip Henry, Earl, *Pres. soc. of Antiquaries. 3, *Grosvenor-place-houses, Grosvenor-place, S.W.; and Chevening, Sevenoaks, Kent.*
1860	*Stanhope, Walter Spencer, Esq. *Cannon-hall, Barnsley, Yorkshire.*
1856	Stanley, Edmund Hill, Esq. *Craven-hotel, Strand, W.C.*
1869	Stanton, Charles Hallerow, Esq. 1, *Mitre-court-buildings, Inner Temple, E.C.*
1863	1900Stanton, Geo., Esq. *Coton-hill, Shrewsbury; and Conservative Club, S.W.*
1867	Stanton, Henry, Esq. 1, *River-street, Myddelton-square, W.C.*
1856	Statham, John Lee, Esq. 60, *Wimpole-street, W.*
1865	*Staveley, Miles, Esq. *Old Skenningford-hall, Ripon.*
1868	Staveley, Major-Gen. Sir Charles, K.C.B. *Government-house, Devonport; and United Service Club, S.W.*
1869	Stebbing, Edward Charles, Esq. *National Debt Office, 19, Old Jewry, E.C.*
1887	Steel, J. P., Esq., Lieut. R.E. *Junior United Service Club, S.W. Care of Messrs. Grindlay and Co.*
1868	Steel, William Strang, Esq. 13, *Leadenhall-street, E.C.*
1830	*Stephen, Sir George. *Mellomont. Care of Mr. H. W. Rasmuscroft, 7, Graf's-inn-square, W.C.*

Year of Election.	
1869	Stephenson, B. Charles, Esq. 12, *Bolton-row, Mayfair, W.*
1857	1910Stephenson, Sir R. Macdonald, C.E. 72, *Lancaster-gate, W.; and East-cottage, Worthing.*
1868	Stephenson, Henry P., Esq. 8, *St. Mary-axe, E.C.*
1868	Stepney, A. K. Cowell, Esq. 6, *St. George's-terrace, Knightsbridge, W.*
1880	Sterling, Col. Sir Anthony. *South-lodge, South-place, Knightsbridge, W.*
1862	Sterry, Henry, Esq. 7, *Paragon, Southwark, S.E.*
1869	Stewart, Col. T. R., Bombay Army. *Esquir, Machynlleth, Wales.*
1835	Stevens, Henry, Esq., F.S.A. 4, *Trafalgar-square, W.C.*
1841	Stevenson, Thomas, Esq., F.S.A. 37, *Upper Grosvenor-street, W.*
1860	Stewart, Rev. Dr. James. *Lovedale, Alice, South Africa. Care of Robert Young, Esq., Offices of the Free Church of Scotland, Edinburgh.*
1860	*Stewart, Major J. H. M. Shaw, Royal Madras Engineers.
1869	1910Stewart, J. L., Esq., M.D., Forest Department, India. *Kew, W.*
1868	Stirling, the Hon. Edward. 34, *Queen's-gardens, Hyde-park, W.*
1860	Stirling, Capt. Frederick H., R.N. *H.M.S. 'Hero;' and United Service Club, S.W.*
1863	Stirling, Sir Walter, Bart. 36, *Portman-square, W.*
1868	Stock, Thomas Osborne, Esq., M.P. 20, *King-street, St. James's, S.W.*
1860	Stocker, John Palmer, Esq. 93, *Oxford-terrace, Hyde-park, W.*
1845	*Stokes, Rear-Admiral John Lort. *United Service Club, S.W.; and Scotchwell, Haverfordwest, Wales.*
1868	Stone, David H., Esq., Alderman. *Sydenham-hill, S.*
1867	*Story, Edwin, Esq., M.A. 3, *King Edward's-terrace, Liverpool-road, Islington, N.*
1868	Storin, Rev. Charles F. 8, *Grosvenor-mansions, Victoria-street, S.W.*
1866	1930Strachey, Colonel Richard, R.E., F.R.S. 29, *Lancaster-gate, Hyde-park, W.*
1861	Strange, Lieut.-Col. Alexander. *India Store Department, Belvedere-road, Lambeth, S.*
1858	Stratford de Redcliffe, Stratford Canning, Viscount. 29, *Grosvenor-square, W.*
1864	Straton, Rev. N. D. J. *Kirkby-wharf, Tadcaster.*
1860	Strickland, Edward, Esq., C.B., Commissary-General. *Halifax, Nova Scotia.*
1868	*Strode, Alf. Rowland Chetham, Esq. *Dunedin, Otago, New Zealand. Care of J. G. Cooke, Esq., 47, Mount-street, Grosvenor-square, W.*
1865	Strong, F. K., Esq., R.H. *Hamburg, Germany; 6, St. Martin's-place, S.W.*
1853	Strousberg, Dr. Bethel Henry. 70, *Wilhelm-strasse, Berlin. Care of Messrs. Asher.*
1853	Strutt, George H., Esq., F.R.A.S. *Bridge-hill, Belper.*
1858	Strutt, Captain Hammond Ingold, F.R.A.S. *Royal Mail Steam Packet Company, Southampton.*
1853	1940*Strzelecki, Count P. E. de, C.B., F.R.S. 23, *Saville-row, W.*
1859	Stuart, Lieut.-Col. J. F. D. Crichton. 25, *Willes-area., Belgrave-sq., S.W.*
1861	Stuart, Vice-Chancellor Sir John. 11 and 12, *Old-buildings, Lincoln's-inn, W.C.; 5, Queen's-gate, Hyde-park, W.; and Granborrish, Isle of Skye, Inverness-shire.*
1866	Stuart, Major Robert. *Jamaica, Albania. Care of Messrs. Bull, Hunter, and Co., 52, Wigmore-street, W.*

Year of Election.	
1858	Sudeley, Lord. 5, *Somerset-place, Curzon-street, W.*
1857	Sullivan, Rear-Admiral Sir Bartholomew J., K.N., K.C.B.
1865	Sullivan, Capt. T. W., C.B., R.N. *Kimpton, Welwyn, Herts.*
1869	Summerhayes, William, Esq., M.D. 18, *Sandringham-gardens, Ealing, W.*
1862	Surridge, Rev. Henry Arthur Dillon, M.A. 21, *Berners-street, W.*
1862	Surtees, Capt. Charles Fiaville. *Chalcott-house, Long Ditton, Surrey.*
1861	1950*Sutherland, George Granville William, Duke of. *Stafford-house, St. James's Palace, S.W.*
1869	Sutherland, Robert, Esq. *Egham-rise, Surrey.*
1869	Sutherland, Thomas, Esq. H 3, *Albany, Piccadilly, W.*
1857	Swanzy, Andrew, Esq. *Sevenoaks, Kent.*
1856	*Swinburne, Rear-Admiral Charles H. *Capheaton, near Newcastle-upon-Tyne.*
1862	*Swinburne, Lieut. Sir John, Bart., R.N. *Capheaton, Newcastle-on-Tyne.*
1863	Swinhoe, R., Esq., H.B.M. Consul. 33, *Oakley-square, S.W.*
1851	Sykes, Colonel William Henry, M.P., F.R.S., Hon. M.R.I.A. *Athenæum Club, S.W.; and 47, Albion-street, Hyde-park, W.*
1864	Symonds, F., Esq., M.D. *Beaumont-street, Oxford.*
1852	*Synge, Col. Millington H., R.E. *Alvercliff, Alverstoke, Hants.*
1852	1950Tagart, Courtenay, Esq. *Rockleaze Point, Durdham Down, near Bristol.*
1859	Tagart, Francis, Esq. 31, *Craven-hill-gardens, Hyde-park, W.*
1866	Taintor, Edward C., Esq. (Imp. Chinese Customs). *Tientsin, China. Care of H. C. Batchelor, Esq., 155, Cannon-street, E.C.*
1864	Tait, P. M., Esq. 38, *Belsize-park, N.W.; and Oriental Club, W.*
1857	*Tait, Robert, Esq. 14, *Queen Anne-street, W.*
1867	Talbot, Right Hon. Richard Gilbert. *Ballincloa, Kingstown, County Dublin.*
1861	Talbot de Malahide, James Talbot, Lord. *Malahide Castle, Co. Dublin.*
1861	Taylor, Commander A. Duncan, R.N. 2, *Gloucester-villas, Upper Eglinton-road, Shooter's-hill, S.E.*
1869	Taylor, George N., Esq. 3, *Clarendon-place, Hyde-park, W.*
1865	Taylor, H. L., Esq. *Reform Club, S.W.; and 23, Phillimore-gardens, Kensington, W.*
1865	1970Taylor, Rev. Jas. Hudson. *Ningpo, China. Care of Mr. Berger, Saint-hill, East Grinstead.*
1863	Taylor, John, Esq. *The Birches, Kingston-hill.*
1867	*Taylor, John George, Esq. *H.B.M. Consul in Kurdistan, Diarbekr.*
1854	*Taylor, John Stopford, Esq., M.D. 1, *Springfield, St. Anne-street, Liverpool.*
1863	Taylor, Col. R. C. H. 16, *Eaton-place, S.W.; and Carlton Club, S.W.*

Year of Election	
1858	Twyford, Capt. A. W., 21st Hussars. *Reform Club, S.W.; and Cookham-house, Cookham, Hants. Care of Mr. Murray, 7, Whitehall-place, S.W.*
1865	Tyer, Edward, Esq., C.E., F.R.A.S. 15, *Old-jewry-chambers, E.C.*
1842	1040*Tyler, George, Esq. 24, *Holloway-place, Holloway-road, N.*
1859	Tytler, Capt. W. *Fraser. Aldourie, Inverness.*
1869	Underdown, E. M. Esq., 3, *King's-bench-walk, Temple, E.C.*
1862	Underhill, Edward Bean, Esq., LL.D. *Derwent-lodge, Thurlow-road, Hampstead, N.W.*
1868	Unwin, Howard, Esq., C.E. 24, *Buckingham-st., E.C.*
1861	Usher, John, Esq. *Arthur's Club, St. James's-street, S.W.*
1844	*Vacher, George, Esq. *Manor-house, Teddington.*
1862	*Vander Byl, P. G., Esq., M.P. *Care of Mr. H. Blyth*, 17, *Gracechurch-st., E.C.*
1865	Vane, G., Esq. *Ceylon. Messrs. Price and Bousteud.*
1850	*Vaughan, James, Esq., F.R.G.S., Bombay Army. *Builth, Brecknshire.*
1861	1050Vaughan, J. D., Esq., Assist. Res. Councillor and Police Magistrate of Singapore. *Care of J. Tupp, Esq., 4, Lancaster-road, Notting-hill, W.*
1849	Vaux, William S. W., Esq., M.A., F.S.A. *British Museum, W.C.*
1852	*Vavasour, Sir Henry M., Bart. 8, *Upper Grosvenor-street, W.*
1855	Vavasour, James, Esq. *Knockholt, near Sevenoaks, Kent.*
1867	Venner, Capt. Francis John S. *Dilston-house, Upper Norwood, S.; and Elmbank, near Worcester.*
1863	*Vereker, the Hon. H. P., LL.D., H.M. Consul at Rio Grande do Sul. 1, *Portman-square, W.*
1862	Verner, Edward Wingfield, Esq., M.P. *The Ash, Brny, County Wicklow.*
1862	*Verney, Edmund H., Commr. R.N. *32, South-street, Grosvenor-square, W.*
1837	*Verney, Major Sir Harry C., Bart., M.P., F.R.A.S. *Travellers' Club, S.W.; 32, South-street, Grosvenor-square, W.; and Claydon-house, Bucks.*
1857	Verrey, Charles, Esq.
1852	1060Versalam, James Walter, Earl of, *Gorhambury, near St. Alban's; Barry-hill, Surrey; and Mossley-hall, Essex.*
1865	Vile, Thomas, Esq. 75, *Oxford-terrace, W.*
1865	*Vincent, Miss C., Esq., C.E. *Frankfort, Ohio, U.S.; and* 127, *Strand, W.C.*
1857	Vincent, John, Esq. 4, *Granville-park, Blackheath, S.E.*
1858	Vines, William Reynolds, Esq., F.R.A.S. *Care of R. P. Hollyer, Esq., Ivy Church, Shrewsbury-lane, Shooter's-hill, Plumstead, S.E.; and* 4, *Thames-inn, Hollows-hill, E.C.*
1865	Vivian, Major Quintus, late 8th Hussars. 17, *Chesham-street, S.W.*
1838	*Vyvyan, Sir Richard Rawlinson, Bart., F.R.S. *Trelowarren, Cornwall.*

Year of Election	
1852	Wade, Mitchell R., Esq. 66, *South John-street, Liverpool.*
1864	Wade, R. E., Esq. 13, *Seymour-street, Portman square, W.*
1863	Wade, Thos. F., Esq., C.B., H.B.M. Secretary of Legation. *Pekin, China.*
1858	2070*Wagstaff, William Rarster, Esq., M.D., M.A.
1869	Waite, Charles, Esq., LL.D., Principal of St. John's College. *Weighton-road, South Penge-park, S.E.*
1863	Waite, Henry, Esq. 3, *Victoria-street, Pimlico, S.W.*
1867	*Waite, Rev. John. 48, *Torrington-square, Bloomsbury, W.C.*
1864	Wakefield, E. T., Esq. 40, *Pembridge-villas, Bayswater, W.*
1866	Walker, Alexander, Esq. *Preston, Kirkbean, near Dumfries.*
1862	Walker, Col. C. P. Beauchamp, C.B. 97, *Onslow-square, S.W.; and United Service Club, S.W.*
1861	Walker, Edward Henry, Esq., Consul at Cagliari. *Newton-hall, Chester.*
1863	*Walker, Frederick John, Esq. *Allt yr Odyn, Llandyssil, Carmarthen, Wales.*
1863	Walker, James, Esq., Managing Director of Madras Railway. 23, *Cumberidge-square, Hyde-park, W.*
1859	2080*Walker, Lt.-Col. James, Bombay Engineers. *Murree, near Rawul Pindi, Punjab. Care of Messrs. H. S. King and Co., Pall-mall, S.W.*
1830	Walker, John, Esq., Hydrog. Indian Office. 9, *Castle-street, Holborn, W.C.*
1861	*Walker, John, Esq. 60, *Porchester-terrace, W.*
1858	*Walker, Captain John, H.M.'s 66th Foot. *Broom-hill, Colchester.*
1864	Walker, R. B. N., Esq. *Care of Mr. Blissett, 38, South Castle-st., Liverpool.*
1863	*Walker, T. F. W., Esq. 6, *Brock-street, Bath; and Athenæum Club, S.W.*
1853	Walker, Captain William Harrison, R.C.S. 3, *Gloucester-terrace, W.; and Board of Trade, S.W.*
1861	Walker, Rev. William. *Grammar-school, Henley Castle, Upton-on-Severn.*
1861	Walker, Rev. William Henry, M.A. *Necton-rectory, Elsham, Norfolk.*
1866	Walker, William, Esq., F.S.A. 48, *Hilldrop-road, Tufnell-park, N.*
1858	2090Walkinshaw, William, Esq. 74, *Lancaster-gate, Hyde-park, W.*
1854	Wallace, Alfred Russell, Esq. 9, *St. Mark's-crescent, Regent's-park, N.W.*
1861	Wallace, Rev. Charles Hill, M.A. 3, *Hurley-place, Clifton, Bristol.*
1868	Waller, Major George Henry. 16, *Eaton-square, S.W.*
1864	Waller, Rev. Horace. *St. John's, Chatham.*
1860	Waller, Sir Thos. Watton, Bart. 16, *Eaton-square, S.W.*
1863	Wallich, George C., Esq., M.D. 11, *Earl's-terrace, Kensington, W.*
1864	Walmsley, Joshua, Government Resident Agent. *Natal.*
1860	Walpole, Capt. the Hon. F., M.P. *Travellers' Club, S.W.; and Raynthorpe-hall, Long Stratton, Norfolk.*
1863	Walpole, Rt. Hon. Spencer, M.P. *Grafton-street, W.; and Ealing, W.*
1853	2100Walter, Henry Fraser, Esq. *Popplewick-hall, near Nottingham.*
1865	Walton, H. C., Esq., C.E. 26, *Savile-row, W.*
1862	Walton, J. W., Esq. 26, *Savile-row, W.*
1864	Walton, R. G., Esq., C.E.
1853	*Ward, George, Esq.

Year of Election	
1860	Ward, Admiral J. Hamilton. *Oakfield, Wimbledon-park, S.W.*
1865	Ward, Swinburne, Esq., Civil Commissioner. *Seychelles Islands.*
1869	Ward, Capt. the Hon. Wm. John, R.N. *H.M. Legation, Washington. Care of the American Department, Foreign-office, S.W.*
1868	Ward, William Robert, Esq. 22, *Thurloe-square, S.W.*
1862	Wardlaw, John, Esq. 57, *Prince's-gate, Kensington, W.*
1858	2110Wardlaw, Col. Robert, C.B. *United Service Club, S.W.*
1864	Warner, E., Esq. 49, *Grosvenor-place, S.W.*
1859	Warre, Arthur B., Esq. 109, *Onslow-square, S.W.*
1869	Warre, Col. H. J., C.B. *United Service Club, S.W.*
1869	Warren, Charles, Esq. 17, *Hanover-street, Peckham, S.E.*
1862	Warren, Capt. Richard Pelham. *Worting-house, Basingstoke.*
1867	Washbourn, B., Esq., M.D., &c. *Eastgate-house, Gloucester.*
1867	Waterhouse, George Marsden, Esq. *Care of Messrs. Morrison and Co., Philpot-lane, E.C.*
1852	Watkins, John, Esq., F.R.C.S., F.S.A. 2, *Falcon-square, Aldersgate-street, E.C.*
1862	Watney, John, Esq. 16, *London-street, Finchurch-street, E.C.*
1859	2130Watson, James, Esq. 24, *Endsleigh-street, W.C.*
1860	Watson, James, Esq., Barrister-at-Law. 15, *Circus, Bath.*
1861	Watson, John Harrison, Esq. 28, *Queensborough-terrace, Kensington-gardens, W.*
1868	Watson, Robert, Esq. 32, *Inverness-road, Bayswater, W.*
1867	Watson, Robert Spence, Esq. *Moss Croft, Gateshead-on-Tyne.*
1853	Watts, J. King, Esq. *St. Ives, Huntingdonshire.*
1857	*Waugh, Maj.-General Sir Andrew Scott, Bengal Engineers, F.R.S., late Surveyor-General and Superintendent Great Trig. Survey. *Athenæum Club, S.W.; and 7, Petersham-terrace, Queen's-gate-gardens, South Kensington, W.*
1861	Way, Arthur, Esq. *Ashton-lodge, Ashton, near Bristol.*
1868	Webb, Edward B., Esq., C.E., &c. 34, *Great George-street, S.W.*
1858	*Webb, Capt. Sydney. *Oriental Club, Hanover-square, W.; and 24, Manchester-square, W.*
1862	2150*Webb, William Frederick, Esq. *Army and Navy Club, S.W.*
1836	*Webber-Smith, Maj.-General James, 95th Regiment. 23, *Devonshire-terrace, Hyde-park, W.*
1865	Webster, Alphonsus, Esq. 44, *Mecklenburg-square, W.C.*
1864	Webster, E., Esq. *North-lodge, Ealing, W.*
1858	Webster, George, Esq., M.D. *Dulwich, S.E.*
1866	Webster, George, Esq. 40, *Finsbury-circus, E.C.*
1860	Wegselin, Thomas Matthias, Esq., M.P. *Peninsular and Oriental Steam Navigation Co., Moorgate-street, E.C.*
1851	Weller, Edward, Esq. 34, *Red-lion-square, W.C.*
1853	*Wellington, Arthur Richard, Duke of, Major-General, K.C.I. *Apsley-house, W.; and Strathfieldsaye, Hampshire.*
1864	Wells, Sir Mordaunt, late Chief Prime Judge, Bengal. 107, *Victoria-st., S.W.*
1862	2140Wells, William, Esq. 22, *Brston-street, W.; and Redleaf, Penshurst, Kent.*

Year of Election	
1863	Welman, Chas., Esq. *Norton-manor, Taunton.*
1868	Wentworth, William Charles, Esq. *Coombe-lodge, Pamphourne, Berks.*
1857	West, Lieut.-Colonel J. Temple.
1861	West, Rev. W. De Lancy, D.D., Head Master, Grammar School. *Brentwood, Essex.*
1863	*Westlake, John, Esq. 16, *Oxford-square, W.*
1859	Westmacott, Arthur, Esq. *Athenæum Club, S.W.*
1852	Weston, Alex. Anderdon, Esq., M.A. 18, *Rutland-gate, Hyde-park, S.W.*
1862	Westwood, John, Esq. 8 *and* 9, *Queen-street-place, Southwark-bridge, E.C.*
1863	Weston, Champion, Esq. *Somerset-hill, Darking.*
1830	2150*Weyland, John, Esq., F.R.S. *Woodrising-hall, Norfolk.*
1866	Wharncliffe, Lord. 15, *Carcon-street, W.*
1861	Wharton, Rev. J. C. *Willesden-vicarage, N.W.*
1858	Wheatley, G. W., Esq. 150, *Leadenhall-street, E.C.*
1859	Wheelwright, William, Esq. *Gloucester-lodge, Regent's-park, N.W.*
1853	*Whitfield, Edward Wray, Esq., B.A. *South Ellington-vicarage, Louth.*
1839	*Whishaw, James, Esq., F.S.A. *Oriental Club, W.*
1867	Whitaker, Thomas Stephen, Esq. *Easthorpe-hall, East Yorkshire; and Conservative Club, S.W.*
1868	Whitby Rev. Thomas, M.A., &c. *St. John's-terrace, Woodhouse Moor, Leeds.*
1857	White, Arthur D., Esq., M.D. 58, *Chancery-lane, W.C.*
1865	2160White, Lieut. Arthur Wellesley, R.A. *Kingston, Canada. Care of Capt T. P. White, R.E., Ordnance Survey, Edinburgh.*
1855	*White, Charles, Esq., J.P. 10, *Lime-st., E.C.; and Barnesfield-house, Dartford, Kent.*
1857	White, Henry, Esq. 5, *Lancaster-gate, Hyde-park, W.*
1862	White, Col. Henry Dalrymple, C.B. 39, *Lowndes-square, S.W.*
1869	White, Robert Owen, Esq. *The Priory, Lewisham, S.E.*
1866	White, W. A., Esq. *Care of E. Hertslet, Esq., Foreign-office, S.W.* Oriental *Service Club, S.W.*
1852	White, William Foster, Esq. *Treasurer, St. Bartholomew's Hospital, E.C.*
1863	*White, William O., Esq. 10, *Lime-street, E.C.; and Barnsfield, near Dartford, Kent.*
1862	Whitehouse, William Matthew Mills, Esq. 46, *Chepstow-place, Bayswater, W.; and Hardwicke-house, Studley, Warwickshire.*
1862	Whitmore, William, Esq. 28, *Oxford-square, W.; and Beckenham, Kent, S.E.*
1860	2170Whitty, John Irwine, Esq., D.C.L., LL.D., M.A., C.E., &c. 94, *Lower Baggot-street, Dublin; Richardstown-hall, Co. Carlow; and Providence-court, Queen's Co., Ireland.*
1865	Whymper, Edward, Esq. *Town-house, Hailsmere.*
1864	Wigyte, M. B., Esq. 115, *St. George's-road, S.W.*
1869	Whytt, Ebenezer, Esq. *The Grove, Highgate, N.*
1867	Wilkins, J. E., Esq. *Odessa, S. Russia. Care of T. P. Cobb, Esq., 9, Craven-hill-gardens, Hyde-park, W.*
1866	Wilkinson, Alfred, Esq. 14, *Elvaston-place, South Kensington, W.*

Year of Election	
1860	*Wilkinson, Major A. Eastfield, R.A. *Ordn. Commission, India*; 7, *Cavendish-place, Brighton*; and *Army and Navy Club, S.W.*
1854	Wilkinson, Frederick E., Esq., M.D. *Sydenham, Kent, S.E.*
1865	Wilkinson, Dr. G. 4, *St. John's-wood-villas, St. John's-wood, N.W.*
1865	Wilkinson, J. J., Esq. 31, *Springfield-road, St. John's-wood, N.W.*
1838	2180*Wilkinson, Sir John Gardner, D.C.L., F.R.S. *Braufield-house, Reynoldston, Gower, Glamorgan.*
1868	Wilkinson, James, J. Esq.
1857	Willcock, J. W., Esq., Q.C. 6, *Stone-buildings, Lincoln's-inn, W.C.*; and *Rosenstead, Avenue-road, St. John's-wood, N.W.*
1869	Williams, Charles Henry, Esq. *Churchill-house, Churchill, Somersetshire.*
1865	Williams, Frederick, G. A., Esq. *Chapel-stairs, Lincoln's-inn, W.C.*
1856	Williams, Henry Jones, Esq. 10, *Hereford-street, Park-lane, W.*; and 82, *King William-street, E.C.*
1850	Williams, Henry R., Esq. 183, *Camden-road, N.*
1857	Williams, Major-General Sir Wm. F., Bart., K.C.B., D.C.L., Commander-in-Chief, Canada. *Army and Navy Club, S.W.*
1867	Williams, W. Rhys, Esq., M.D. *Royal Bethlehem Hospital, S.*
1868	*Williams, Michael, Esq. *Tregullow, Scorrier, Cornwall.*
1868	2190*Williams, F. M., Esq. *Goonbren, Penen, Arwenthal, Cornwall.*
1850	Willoughby, Henry W., Esq. 35, *Montagu-square, W.*
1867	Wills, William Henry, Esq. (J. P. for city and county of Bristol). *Hawthornden, Clifton Down, Bristol.*
1868	Wilson, Alexander, Esq. 24, *Highbury-place, N.*
1861	Wilson, Captain Anthony. 55, *Moorgate-street, E.C.*; and 11, *Chepstow-villas, Bayswater, W.*
1869	Wilson, Capt. Charles William, R.E. 4, *New-street, Spring-gardens, S.W.*
1865	Wilson, E., Esq. *Hayes-place, Bromley, Kent.*
1865	Wilson, Capt. J. C., R.N. *Care of Messrs. Woodhead and Co.*
1862	2200*Wilson, Robert Dobie, Esq. 15, *Green-street, Grosvenor-square, W.*
1869	Wilson, Samuel King, Esq. 3, *Portland-terrace, Regent's-park, N.W.*
1869	Wilson, Rev. T. Given, B.A. *The Parsonage, Halstead, Essex.*
1854	Wilson, Captain Thomas, R.N.
1860	Wilson, Thomas, Esq. 3, *St. George's-villas, Cricketfield-road, Lower Clapton, N.E.*
1866	Wiltshire, Rev. Thomas, M.A., F.G.S., F.L.S. 13, *Granville-park, Lewisham, S.E.*
1868	*Winch, W. Richard, Esq. *Chalehurst, Kent.*
1846	*Winchester, Right Rev. Samuel Wilberforce, Lord Bishop of, F.R.S., F.S.A. 26, *Pall-mall, S.W.*
1865	
1862	Windham, Capt. S. Smyth.
1863	Wing, Commr. Arthur, R.N. *Care of Messrs. Cox and Lowndes's.*
1851	Wingate, T. F., Esq. 7, *Dover-street, Piccadilly, W.*
	Wingfield, Sir Charles John, M.P. *Commissioner in Ordn.* 10, *Great Cumberland-street, Hyde-park, W.*; and *Athenæum Club, S.W.*

Year of Election.	
1854	2210Wodehouse, J. H., Esq., H.M.'s Commissioner and Consul-General for the Sandwich Islands. *Care of F. B. Alston, Esq., Foreign-office.*
1865	Wolfe, Capt. William Maynard, R.A. *Arts Club, Hanover-square, W.*
1856	*Wolff, Sir Henry Drummond, K.C.M.G. 15, *Rutland-gate, S.W.; and Athenæum Club, S.W.*
1868	Wool, Capt. John. *Oriental Club, W.*
1863	Wool, Hy., Esq. 10, *Cleveland-square, Hyde-park, W.*
1865	Wood, Lieut.-Colonel Wm., R.M. 4, *Hyde-park-terrace, Cumberland-gate, W.*
1868	*Wood, Richard Henry, Esq., F.S.A. *Crumpsall, near Manchester.*
1857	Woodhead, Major H. J. Pinnridge. 44, *Charing-cross, S.W.*
1867	Woodfield, Mathew, Esq., M.I.C.E. *General Colonial Manager, Cape Copper Mining Co., Namaqualand, Cape of Good Hope.*
1862	Woods, Samuel, Esq. *Micklebam, near Dorking, Surrey.*
1854	2210Woolcott, Geo., Esq. 7, *Palace-gardens-villas, Kensington, W.*
1863	*Worms, George, Esq. 17, *Park-crescent, Portland-place, W.*
1845	Worthington, Rev. James, D.D. 27, *John-street, Bedford-row, W.C.*
1856	Worthington, J. Hall, Esq. *Alton-hill, Oxton, near Birkenhead.*
1866	*Worthington, Richard, Esq. 7, *Champion-park, Denmark-hill, S.*
1857	Wortley, Rt. Hon. Jas. Stuart, Q.C. 29, *Berkeley-sq., W.; and Sheen, Surrey, S.*
1851	Wortley, the Hon. J. F. Stuart. 15, *Curzon-street, Mayfair, W.*
1866	Wotton, William G., Esq., M.D. 15, *Clements-inn, W.C.*
1839	*Wyld, James, Esq. *Charing-cross, W.C.*
1863	Wylde, W. H., Esq. *Foreign-office, S.W.*
1868	2230Wyllie, John William Shaw, Esq., M.P. 14, *St. James's-square, S.W.; and 37, Charles-street, W.*
1867	*Wythes, George Edward, Esq. 22, *Westbourne-terrace, Hyde-park, W.*
1869	Yardley, Sir William. *Hadlow-park, Tonbridge, Kent.*
1854	Yeats, John, Esq., LL.D. *Clayton-place, Peckham, S.E.*
1861	York, Most Rev. William Thomson, Archbishop of. *Bishopthorpe, York.*
1859	Yorke, Lieut.-General Sir Charles, K.C.B. 19, *South-st., Grosvenor-square, W.*
1850	*Yorke, Colonel Philip J., F.R.S. 89, *Eaton-place, S.W.*
1857	*Young, Capt. Allen. *Riversdale, Twickenham, S.W.*
1858	*Young, Charles Baring, Esq. 4, *Hyde-park-terrace, W.*
1866	Young, Francis, Esq. *Belmont-villa, Belmont-road, Peckham, S.*
1850	2240*Young, George Frederick, Esq. *Limehouse, E.*
1862	Young, Sir Henry E. Fox, G.B. 77, *Kensington-gardens-square, W.*
1830	*Young, James, Esq.
1858	Young, James, Esq. *Lime-field, West Calder, Midlothian.*

Year of Election	
1866	Young, John, Esq., F.S.A. *Vanbrugh-fields, Blackheath, S.E.*
1865	Young, Rev. R. H., B.A. *Royal Naval School, New Cross, S.E.*
1868	Young, William, Esq. 7, *Vernon-place, Bloomsbury-square, W.C.*
1857	Yule, Col. Henry, Bengal Engineers. *Messrs. Grindlay & Co., 55, Parliament-street, S.W.*
1865	Yule, Rev. J. W. *Alexandria, Egypt.*
1864	2249Zwecker, J. B., Esq. 55, *Patshull-road, Kentish-town, N.W.*

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TO WHICH COPIES OF THE 'JOURNAL' AND 'PROCEEDINGS' ARE PRESENTED.

[Those marked with an asterisk * receive the Proceedings only.]

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Admiralty (Hydrographic Office)
Agricultural Society (Royal)
Antiquaries, Society of
Anthropological Society
Architects, Inst. of British (Royal)
Arts, Society of
Asiatic Society (Royal)
Astronomical Society (Royal)
Athenæum Club
British Museum, Library of
Cambridge University. The Library
Colonial Office
Dublin Trinity College Library
——— Geological Society (Trin. Coll.)
Edinburgh, Royal Society of
———, The Library of Advocates
———, Geological Society of
Education Department, Library of
Engineers, Institution of Civil
Ethnological Society
Foreign Office, Library of
Geological Society
Geology, Museum of Practical
Her Majesty the Queen, Library of
Horticultural Society (Royal)
Hudson Bay Company's Library
India Office, Library of the
Lancashire and Cheshire, Historic Society of
Linnean Society
Literature, Royal Society of
Liverpool Literary and Philosophical Society
*——— Mercantile Marine Association
*London Library, the
Manchester Chetham Library
——— Free Library
*——— Literary and Philosophical Society
Newcastle-upon-Tyne Literary and Philosophical Institution
Oxford, The Bodleian Library at
*———, Radcliffe Observatory
*Post Office Library and Literary Association
Royal Artillery Institution, Woolwich, S.E.
Royal Dublin Society
Royal Institution
——— Society
Salford Royal Museum and Library, Peel Park, Salford.
Staff College, Farnborough Station, Hants.
Statistical Society
Trade, Board of, Library of
Travellers' Club
United Service Institution (Royal)
War Department, Topographical Depôt
Zoological Society

EUROPE.

Amsterdam . . Royal Acad. of Sciences
Athens . . . . University Library
Belgium . . . . Royal Acad. of Science
——— . . . . Geographical Society
Berlin . . . . Academy of Sciences
——— . . . . Geographical Society
Christiania . University Library
Copenhagen . Hydrographic Office
——— . Royal Danish Ordnance Survey
——— . Royal Society of Sciences
——— . ——— of Northern Antiquaries
Dijon . . . . . Académie des Sciences, Arts et belles Lettres
Darmstadt . . Geographical Society
Dresden . . . Statistical Society
Florence . . Italian Geographical Society
——— . . National Library of
——— . . Ministry of Public Instruction.
Frankfort . . Geographical Society
Geneva . . . . Geographical Society of
——— . . . Society of Natural History
*Gotha . . Perthes, M. Justus
Hague (the) . Royal Institute for Geography and Ethnology of Netherland India.
Halle and Leipzig } German Oriental Society
Jena . . . . . University of
Leipzig . . . . Verein von Freunden der Erdkunde zu
Lisbon . . . . Royal Acad. of Sciences
Madrid . . . . Royal Acad. of Sciences
Milan . . . . . Lombardo-Veneto Institute of
Munich . . . . Bibliothèque Centrale Militaire
——— . . . . Royal Library
Paris . . . . . Institut Imperial
——— . . . . . Académie des Sciences

EUROPE—*continued.*

PARIS . . . . . Annales de l'Agriculture et des Régions Tropicales (Madinier, M.)
——— . . . . . Bibliothèque Impériale
——— . . . . . Dépôt de la Guerre
——— . . . . . Dépôt de la Marine
——— . . . . . Ministère de la Marine et des Colonies
——— . . . . . Société Asiatique
——— . . . . . Société d'Ethnographie
——— . . . . . Société d'Encouragement pour l'Industrie Nationale
——— . . . . . Société de Géographie
PESTH . . . . . Hungarian Academy of Sciences
*PRAGUE . . . . Bohemian Royal Museum
ROME . . . . . Accademia dei Lincei
ST. PETERSBURG Imperial Academy of Sciences
ST. PETERSBURG Imperial Geographical Society
STOCKHOLM . . Bureau de la Recherche Géologique de la Suède.
——— . . Royal Academy of Sciences.
STRASBURG . . . Société des Sciences Naturelles
TUBINGEN . . . University Library
*UTRECHT . . . Royal Dutch Meteorological Institute
VENICE . . . . . Armenian Convent Lib.
VIENNA . . . . Imperial Academy of Sciences
——— . . . Imperial Geographical Society
——— . . . . Imperial Geological Institute
ZURICH . . . . . Society of Antiquaries
——— . . . . . Society of Naturalists

ASIA.

BOMBAY . . . . Geographical Society
——— . . . . Asiatic Society
CALCUTTA . . . Asiatic Society of Bengal
——— . . . Geolog. Survey of India
CALCUTTA . . . Public Library
DEHRA DHOON. Great Trigonometrical Survey of India, Library of
KURRACHEE . . Gen. Lib. and Museum
MADRAS . . . . Literary and Philosoph. Society
SHANGHAI . . . Royal Asiatic Society (North China Branch)
SINGAPORE. . . Journal of Indian Archipelago

AFRICA.

CAIRO . . . . . Egyptian Society
CAPE TOWN . . The Public Library

AMERICA.

ALBANY . . . . New York State Library
BOSTON . . . . American Society of Arts and Sciences
——— . . . . . Massachusetts State Library
——— . . . . . Public Library
——— . . . . . Society of Nat. History
BRAZIL . . . . Historical and Geographical Institute of
CALIFORNIA . . Academy of Sciences
CHILE . . . . . University of
MEXICO . . . . Geographical and Statistical Society of
NEW HAVEN. . Yale College Library
*——— . . Silliman's Journal
NEW YORK . . Geographical and Statistical Society
PHILADELPHIA. Academy of Natural Sciences
———, American Philosophical Society
———, Franklin Institute
QUEBEC . . . Library of the Parliament of Canada
*TORONTO . . . Department of Public Instruction for Upper Canada
———, Canadian Institute of
WASHINGTON. . Congress Library of
——— . Smithsonian Institution
——— . National Observatory
WORCESTER . . Antiquarian Society

AUSTRALASIA.

ADELAIDE . . . . . South Australian Institute.
MELBOURNE . . . . . Public Library.
*——— . . . . Mining Department.
*VICTORIA . . . . Royal Society.
NEW ZEALAND . . . Library of the House of Representatives
SYDNEY . . . . University Library.
TASMANIA . . . . . Royal Society

NAMES OF INDIVIDUALS TO WHOM THE ROYAL PREMIUMS AND OTHER TESTIMONIALS HAVE BEEN AWARDED.

1831.—Mr. Richard Lander, for the discovery of the course of the River Niger or Quorra, and its outlet in the Gulf of Benin.

1832.—Mr. John Biscoe, for the discovery of the land now named "Enderby Land" and "Graham Land," in the Antarctic Ocean.

1833.—Captain Sir John Ross, R.N., for discovery in the Arctic Regions of America.

1834.—Sir Alexander Burnes, for the navigation of the River Indus, and a journey by Balkh and Bokhara, across Central Asia.

1835.—Captain Sir George Back, R.N., for the discovery of the Great Fish River, and its navigation to the sea on the Arctic Coast of America.

1836.—Captain Robert FitzRoy, R.N., for the survey of the Shores of Patagonia, Chile, and Peru, in South America.

1837.—Colonel Chesney, R.A., for the general conduct of the "Euphrates Expedition" in 1835-6, and for accessions to the geography of Syria, Mesopotamia, and the Delta of Susiana.

1838.—Mr. Thomas Simpson—Founder's Medal—for the discovery and tracing, in 1837 and 1838, of about 300 miles of the Arctic shores of America.

——— Dr. Edward Rüppell—Patron's Medal—for his travels and researches in Nubia, Kordofán, Arabia, and Abyssinia.

1839.—Col. H. C. Rawlinson, K.L.S.—Founder's Medal—for his travels and researches in Susiana and Persian Kurdistán, and for the light thrown by him on the comparative geography of Western Asia.

——— Sir R. H. Schomburgk—Patron's Medal—for his travels and researches during the years 1835-9 in the colony of British Guayana, and in the adjacent parts of South America.

1840.—Lieut. Raper, R.N.—Founder's Medal—for the publication of his work on 'Navigation and Nautical Astronomy.'

——— Lieut. John Wood, I.N.—Patron's Medal—for his survey of the Indus, and re-discovery of the source of the River Oxus.

1841.—Captain Sir James Clark Ross, R.N.—Founder's Medal—for his discoveries in the Antarctic Ocean.

——— Rev. Dr. E. Robinson, of New York—Patron's Medal—for his work entitled 'Biblical Researches in Palestine.'

1842.—Mr. Edward John Eyre—Founder's Medal—for his explorations in Australia.

——— Lieut. J. F. A. Symonds, R.E.—Patron's Medal—for his survey in Palestine, and levels across the country to the Dead Sea.

1843.—Mr. W. J. Hamilton—Founder's Medal—for his researches in Asia Minor.

——— Prof. Adolph Erman—Patron's Medal—for his extensive geographical labours.

1844.—Dr. Beke—Founder's Medal—for his extensive explorations in Abyssinia.
——— M. Charles Ritter—Patron's Medal—for his important geographical works.

1845.—Count P. E. de Strzelecki—Founder's Medal—for his explorations and discoveries in the South-Eastern portion of Australia, and in Van Diemen's Land.
——— Professor A. Th. Middendorff—Patron's Medal—for his extensive explorations and discoveries in Northern and Eastern Siberia.

1846.—Captain Charles Sturt—Founder's Medal—for his various and extensive explorations in Australia.
——— Dr. Ludwig Leichhardt—Patron's Medal—for a journey performed from Moreton Bay to Port Essington.

1847.—Sir James Brooke, Rajah of Saráwak and Governor of Labuan—Founder's Medal—for his expedition to Borneo.
——— Captain Charles Wilkes, U.S.N.—Patron's Medal—for his Voyage of Discovery in the S. Hemisphere and in the Antarctic Regions, in the years 1838-42.

1848.—Austen H. Layard, Esq., D.C.L. M.P.—Founder's Medal—for his contributions to Asiatic geography, researches in Mesopotamia, and discoveries of the remains of Nineveh.
——— Baron Ch. Hügel—Patron's Medal—for his explorations of Cashmere and surrounding countries, communicated in his work entitled 'Kashmir und das Reich der Sick.'

1849.—Col. John Ch. Frémont—Patron's Medal—for his successful explorations of the Rocky Mountains and California; and for his numerous Discoveries and Astronomical Observations.
——— The Rev. David Livingstone, of Kolobeng—a Chronometer Watch—for his successful explorations of South Africa.

1850.—Dr. George Wallin, of Finland—25 Guineas—for his Travels in Arabia.
——— Mr. Thomas Brunner—25 Guineas—for his explorations in the Middle Island of New Zealand.

1851.—Dr. John Rae—Founder's Medal—for his survey of Boothia and of the Coasts of Wollaston and Victoria Lands.
——— Captain Henry Strachey—Patron's Medal—for his Surveys in Western Tibet.

1852.—Mr. Francis Galton—Founder's Medal—for his explorations in Southern Africa.
——— Commander E. A. Inglefield, R.N.—Patron's Medal—for his Survey of the Coasts of Baffin Bay, Smith and Lancaster Sounds.

1853.—Rear-Admiral William Henry Smyth—Founder's Medal—for his valuable Surveys in the Mediterranean.
——— Captain Robert J. M. M'Clure, R.N.—Patron's Medal—for his discovery of the North-West Passage.

1854.—The Rev. David Livingstone, M.D., etc.—Patron's Medal—for his Scientific Explorations in Central Africa.
——— Mr. Charles J. Anderssen—a Set of Surveying Instruments—for his Travels in South-Western Africa.

1855.—Elisha Kent Kane, M.D.—Founder's Medal—for his discoveries in the Polar Regions.

1855.—Heinrich Barth, phil. dr.—Patron's Medal—for his explorations in Central Africa.

——— Corporal J. F. Church, of the Royal Engineers—a Watch and Chain—for his scientific observations while attached to the Mission in Central Africa.

1856.—Mr. Augustus C. Gregory—Founder's Medal—for his explorations in Western and Northern Australia.

——— Lieut.-Col. Andrew Scott Waugh, Bengal Engineers—Patron's Medal—for the Great Trigonometrical Survey of India.

1857.—Captain Richard Collinson, r.n.—Founder's Medal—for his Discoveries in the Arctic Regions.

——— Prof. Alex. Dallas Bache, Superintendant U. S. Coast Survey—Patron's Medal—for his extensive Surveys of America.

1858.—Captain Richard F. Burton—Founder's Medal—for his Explorations in Eastern Central Africa.

——— Captain John Palliser—Patron's Medal—for his explorations in British North America and the Rocky Mountains.

——— Mr. John Macdouall Stuart—a Gold Watch—for his Discoveries in South and Central Australia.

1859.—Lady Franklin—Founder's Medal—in commemoration of the discoveries of Sir J. Franklin.

——— Captain Sir F. Leopold McClintock, r.n.—Patron's Medal—for his Discoveries in the Arctic Regions.

1860.—Captain John Hanning Speke—Founder's Medal—for the Discovery of the Great Lake Victoria Nyanza, Eastern Africa, &c.

——— Mr. John Macdouall Stuart—Patron's Medal—for his Explorations in the Interior of Australia.

1861.—Mr. Robert O'Hara Burke—Founder's Medal—for his Explorations in Australia.

——— Captain Thomas Blakiston—Patron's Medal—for his survey of the River Yang-tsze-kiang.

——— Mr. John King—a Gold Watch—for his meritorious conduct while attached to the Expedition under Mr. R. O'Hara Burke.

1862.—Mr. Frank T. Gregory—Founder's Medal—for his explorations in Western Australia.

——— Mr. John Arrowsmith—Patron's Medal—for the very important services he has rendered to Geographical Science.

——— Mr. William Landsborough—a Gold Watch—for successful Explorations in Australia.

——— Mr. John M'Kinlay—a Gold Watch—for successful Explorations in Australia.

——— Mr. Frederick Walker—a Gold Watch—for successful Explorations in Australia.

1863.—Captain J. A. Grant—Patron's Medal—for his journey from Zanzibar across Eastern Equatorial Africa to Egypt, in company with Captain Speke.

——— Baron C. von der Decken—Founder's Medal—for his two Geographical Surveys of the lofty Mountains of Kilima-njaro.

——— Rev. W. Gifford Palgrave—the sum of 25 Guineas—for the purchase of a Chronometer or other Testimonial, for his adventurous Journey in and across Arabia.

1864.—Captain F. G. Montgomerie, r.e.—Founder's Medal—for his Trigonometrical Survey of North-West India.

1864.—Mr. S. W. Baker—Patron's Medal—for his relief of Capts. Speke and Grant, and his endeavour to complete the discoveries of those travellers.

——— Dr. A. Vámbéry—the sum of 40 Pounds—for his Travels in Central Asia.

1865.—Dr. Thomas Thomson, M.D.—Founder's Medal—for his Researches in the Western Himalayas and Thibet.

——— Mr. W. Chandless—Patron's Medal—for his Survey of the River Purûs.

——— M. P. B. du Chaillu—the sum of 100 Guineas—for his Astronomical Observations in the Interior of Western Equatorial Africa.

——— Moolla Abdul Medjid—a Gold Watch—for his Explorations over the Pamir Steppe, &c.

1866.—Admiral Alexis Boutakoff—Founder's Medal—for being the first to launch and navigate ships in the Sea of Aral.

——— Dr. Isaac I. Hayes—Patron's Medal—for his memorable expedition in 1860-61 towards the open Polar Sea.

1867.—Dr. Augustus Petermann—Founder's Medal—for his zealous and enlightened services as a writer and cartographer in advancing Geographical Science.

——— Mr. Gerhard Rohlfs—Patron's Medal—for his extensive and important travels in the interior of Northern Africa.

——— The Pundit, employed by Captain T. G. Montgomerie—a Gold Watch—for his route survey from Lake Mansarowar to Lhasa, in Great Thibet.

——— Mr. John Wilson—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1868.—Professor A. E. Nordenskiöld—Founder's Medal—for the leading part he took in the recent Swedish Expeditions in the North Polar Region.

——— Mrs. Mary Somerville—Patron's Medal—in recognition of the able works published by her, which have largely benefited Geographical Science.

——— Mr. John Kirkby—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

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Royal Charter of Incorporation

TO THE

ROYAL GEOGRAPHICAL SOCIETY.

1859.

Victoria, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, To all to whom these Presents shall come, Greeting.

WHEREAS Sir Roderick Impey Murchison, Knight, and others of our loving subjects did, in the year one thousand eight hundred and thirty, establish a Society, by the name of *The Royal Geographical Society*, for the advancement of Geographical Science, and of which Society we have become the *Patron:*

AND WHEREAS it has been represented to us that the same Society has since its establishment sedulously pursued such its proposed object, by collecting, registering, digesting, and, from time to time, publishing an annual *Journal* of Transactions, which have contributed to the progress of geographical knowledge; by

And we do hereby grant our especial licence and authority, unto all and every person and persons, bodies politic and corporate, otherwise competent to grant, sell, alien, and convey in Mortmain, unto and to the use of the said body politic and corporate, and their successors, any messuages, lands, tenements, or hereditaments, not exceeding such annual value as aforesaid.

And our will and pleasure is, and we further grant and declare, that there shall be a General Meeting, or General Meetings of the Fellows of the said Society, to be held from time to time as hereinafter mentioned; and that there shall be a *Council* to direct and manage the concerns of the said body politic and corporate, and that the General Meetings and the Council shall have the entire direction and management of the same, in the manner and subject to the regulations hereafter mentioned.

And we do hereby also will, grant and declare, that there shall be a President, Vice-Presidents, a Treasurer, and Secretaries of the said body politic and corporate; and that the Council shall consist of the President, Vice-Presidents, Treasurer, Trustees, Secretaries, and not more than twenty-one, nor less than twelve, other Fellows of the said Society.

And we do hereby further will and declare, that the said Sir Roderick Impey Murchison, Knight, shall be the first President of the said body politic and corporate; and the other persons now being the Vice-Presidents, Treasurer, Trustees, Secretaries, together with twenty-one Members of the Council, shall be the first Members of the

Council, and shall continue such until the election of Officers shall be made in pursuance of these presents.

And we do hereby further will and declare, that it shall be lawful for the Fellows of the said body politic and corporate hereby established, to hold a General Meeting once in the year, or oftener, for the purposes hereinafter mentioned, namely, That the President, Vice-Presidents, the Treasurer, the Secretaries, and other members of the Council, shall be chosen at such General Meeting, and that the General Meetings shall from time to time make and establish such Bye Laws, and vary and alter, or revoke the same, as they shall deem to be useful and necessary for the regulation of the said body politic and corporate, for the admission of Fellows and of Honorary and Foreign Members, and for the fixing the number of the Presidents, Officers, and for the management of the proceedings, and the estates, goods, and business of the said body politic and corporate, so that such Bye Laws be not repugnant to these presents, or to the Laws and Statutes of this our realm, and shall and may also enter into any resolution and make any regulation respecting the affairs of the said body politic and corporate that may be necessary and proper.

And we do further will and declare that the General Meetings shall take place at such time as may be fixed by the said Council, and that the present regulations of the said Society, so far as they are not inconsistent with these presents, shall continue in force until the same shall be altered by a General Meeting.

And we further will, grant and declare, that the Council shall have the sole management of the income and funds of the said body politic and corporate, and the appointment of Secretary, Librarian, Curator, and such other officers, attendants, and servants, as the Council shall think necessary or useful, as also the entire management and superintendence of all the other affairs of the said Society, and shall and may, but not inconsistently with or contrary to the provisions of this our Charter, or any existing Bye Law, or Laws and Statutes of this our realm, do all such acts and deeds as shall appear to them necessary for carrying into effect the objects and views of the said body politic and corporate.

Provided always, and we do will and declare, that the Council shall from time to time render to a General Meeting a full account of their proceedings, and that every Fellow of the Society may, at all reasonable times, to be fixed by the said Council, see and examine the accounts of the receipts and payments of the said body politic and corporate.

And we further will, grant and declare, that the whole property of the said body politic and corporate shall be vested, and we do hereby vest the same solely and absolutely in the Fellows thereof, and that they shall have full power and authority to sell, alienate, charge, and otherwise dispose of the same as they shall think proper; but that no sale, mortgage, incumbrance, or other disposition of any messuages, lands, tenements, or hereditaments belonging to the said body politic and

corporate shall be made, except with the approbation and concurrence of a General Meeting.

And we lastly declare it to be our *Royal Will and Pleasure*, that no Resolution or Bye Law shall on any account or pretence whatsoever be made by the said body politic and corporate in opposition to the general scope, true intent, and meaning of this our Charter, or the Laws or Statutes of our realm, and that if any such Rule or Bye Law shall be made, the same shall be absolutely null and void to all intents, effects, constructions, and purposes whatsoever.

In witness whereof we have caused these our Letters to be made Patent.

Witness Ourself, at our Palace at Westminster, this eighth day of February, in the twenty-second year of our reign.

By Her Majesty's command.

(Signed) EDMUNDS.

REGULATIONS.

CORRECTED UP TO THE ANNIVERSARY MEETING, 25TH MAY, 1868.

NOTE.—Any changes that may take place in the Regulations of the Society will be found by reference to the Anniversary Report, published in the Journal of each year.

CHAPTER I.

CONSTITUTION.

1. THE ROYAL GEOGRAPHICAL SOCIETY is instituted for the improvement and diffusion of Geographical Knowledge.

2. The Society consists of Ordinary, Corresponding, and Honorary Fellows; the number of the last mentioned not to exceed forty.

3. A Council shall be chosen annually from the Ordinary Fellows, to conduct the affairs of the Society; and shall consist of a President, four Vice-Presidents, a Treasurer, two Secretaries, a Foreign Secretary, twenty-one Ordinary Councillors, and two Trustees, supernumerary Councillors.

4. A certain portion of the Council shall be changed periodically, viz., the President every second year; and one of the Vice-Presidents, and seven of the Ordinary Councillors every year; the retiring individuals shall be selected by the Council, and shall not be re-eligible to the same office till after the expiration of one year.

5. Every Ordinary Fellow shall be eligible to fill any of the offices in the Council (with such reservation only as the above necessary change may impose): but no Fellow shall hold more than one office at a time.

6. The Society shall, from time to time, under the superintendence of the Council, publish Transactions, and accompany them with Maps and other Illustrations, as occasion may require.

7. The Society shall distribute gratuitously to each Fellow a copy of all the published Transactions; but all will be required to send to the Society for their copies of the JOURNAL. The PROCEEDINGS shall be forwarded, free of expense, to all Fellows residing in the United Kingdom, whose address is known.

8. The PROCEEDINGS shall consist of a narrative of the Proceedings at Meetings, Abstracts of Papers read, Observations on the Papers (unless when objected to by the speakers, upon the proofs being sent to them for correction,—*a course never to be omitted*), and such additional notices as may be sanctioned by the Council.

9. The Society shall also possess a Library, with a collection of Maps, Charts, and Instruments connected with Geographical Science, to which all Fellows shall have access, and Strangers by their orders, under such restrictions as may appear to the Council necessary for their preservation.

10. All donations to the Society shall be recorded in its Transactions, both in the current number of the PROCEEDINGS, and again in the ensuing number of the Journal.

11. The Society shall not and may not make or distribute any dividend, gift, division, or bonus in money, unto or between any of its Fellows.

REGULATIONS OF LIBRARY AND MAP ROOM.

1. The Library shall be open every day in the week (Sundays excepted) from *half-past Ten* in the morning to *half-past Four* in the afternoon, except on Saturday after *half-past Two* P.M., Good Friday, Easter Monday, Christmas Day and the day following; and it shall be closed during the third week in September, in order to be thoroughly cleaned. The Map Room shall be open to Fellows on the same days as the Library, from *half-past Ten* in the morning till *half-past Four* in the afternoon; and to the public

from *Eleven* in the morning to *Four* in the afternoon. On Saturday, the Map Room shall be closed at *half-past Two* P.M.

II. Every Fellow of the Society is entitled (*subject to the Rules*) to borrow as many as four volumes at one time, with the following exceptions:—

1. Dictionaries, Encyclopædias, and other works of reference and cost, Minute Books, Manuscripts, Atlases, Books and Illustrations in loose sheets, Drawings, Prints, and unbound Numbers of Periodical Works, *unless with the special written order of the President.*
2. Maps or Charts, *unless by special sanction of the President and Council.*
3. New Works before the expiration of a year after receipt.

III. The title of every Book, Pamphlet, Map, or Work of any kind lent, shall first be entered in the Library-register, with the borrower's signature, unless applied for by letter in the borrower's hand.

IV. No work of any kind can be retained longer than one month; but at the expiration of that period, or sooner, the same must be returned free of expense, and may then, upon *re-entry*, be again borrowed, provided that no application for it shall have been made in the mean time by any other Fellow.

V. Any gentleman requiring to consult a volume on the premises shall state his wish to the Librarian who will be in attendance, who will procure the same; and every such volume when done with shall be at once handed to the Librarian, to be by him returned to its proper shelf.

VI.—*In all cases a list of the Books, &c., or other property of the Society, in the possession of any Fellow, shall be sent in to the Assistant Secretary* ON OR BEFORE THE 1ST OF JULY IN EACH YEAR.

VII. In every case of loss or damage to any volume, or other property of the Society, the borrower shall make good the same; and all or any property shall be considered as lost, and recovery of its value be capable of being enforced, which is not returned within four months after application for it.

VIII. No stranger can be admitted to the Library except by the introduction of a Fellow, whose name, together with that of the Visitor, shall be inserted in a book kept for that purpose.

IX. Fellows transgressing any of the above Regulations shall be reported by the Assistant Secretary to the Secretaries, and by

them to the Council, who will take such steps as the case may require.

X. In consideration of the grant of 500*l.* per annum from Her Majesty's Government, the Map Room of the Society shall be open to all persons seeking geographical information.

Chapter II.

ELECTION AND ADMISSION OF FELLOWS.

1. Every person desirous of admission into the Society as an Ordinary Fellow must be proposed and recommended agreeably to the Form No. 1 in the Appendix hereto; and such recommendation must be subscribed by two Fellows at least, one of whom *must* certify his personal knowledge of such candidate.

2. The Certificate, thus filled up, shall be delivered to the Secretaries, and shall be read out at the next Ordinary Meeting of the Fellows; after which it shall be suspended in a conspicuous place in the Society's rooms till the next Meeting.

3. The Election of Fellows is entrusted to the Council; and the names of those so elected shall be regularly announced from the chair at each Ordinary Evening Meeting.

4. The Assistant Secretary shall send to every newly elected Fellow notice of his election within three days; together with a Copy of the Regulations of the Society, corrected to the date of issue, a List of the Fellows, and a Card announcing the days on which the Ordinary Meetings will be held during the season. But no election of an Ordinary Fellow shall be complete, neither shall the name of any such be printed in any list of the Society, nor shall he be entitled to exercise any of the privileges of a Fellow, until he shall have paid his admission-fee and first year's contribution, or compounded for the same, as hereafter to be explained; and unless these payments be made within three calendar months from the date of election, such election shall be void.

5. Every newly elected Fellow, having paid his fees, shall,

at the first Ordinary Meeting at which he shall be present, be introduced by some Fellow to the President, or Chairman of the evening, who shall formally admit him.

6. Honorary and Corresponding Fellows shall be elected with the same formalities, but can only be proposed by the Council. They are not eligible to fill any office in the Council (Chap. 1. sect. 3); but in all other respects they have the same privileges as Ordinary Fellows.

7. The Council are empowered to remit the entrance fees and subscriptions in a limited number of cases, where it may be found desirable to elect gentlemen to the Fellowship who are distinguished for their services to Geographical Science, and whose circumstances render it inconvenient to them to make the necessary payments.

Chapter III.

WITHDRAWAL AND REMOVAL OF FELLOWS.

1. Any Fellow may withdraw from the Society, by signifying his wish to do so, by letter under his own hand, addressed to the President or Secretaries, at the apartments of the Society; provided always that such Fellow shall continue to be liable for his annual contribution for the year in which he signifies his wish to withdraw; and he shall further continue liable for such annual contribution until he shall have discharged all sums, if any, due by him to the Society; and shall have returned all books or other property borrowed by him of the Society; or shall have made full compensation for the same, if lost, or not forthcoming.

2. Any Fellow may be removed from the Society, if there shall appear to a Special General Meeting of the Fellows, called expressly to consider the question, sufficient cause for such removal. The sense of the Meeting to be taken by ballot; and if two-thirds of the Fellows shall vote for his removal, such vote shall be decisive.

Chapter IV.

PAYMENTS TO THE SOCIETY.

1. Every Ordinary Fellow shall, on his election, be required to pay £3 as his admission fee, and £2 as his annual contribution for the year ending on the 31st December then next ensuing, or he may compound either at his entrance by one payment of £28, or at any subsequent period by the payment of £25, if his entrance fee be already paid. And no Fellow shall be entitled to vote or to enjoy any other privilege of the Society so long as he shall continue in arrear. Honorary and Corresponding Fellows are not required to make any payments.

2. The first Annual payment of Fellows elected in November and December shall be considered to extend to the *second* 31st December following their elections.

3. So soon in every year as the Auditors shall have completed their financial investigation, the name of every Fellow in arrear to the Society, together with a statement of the arrear, shall be reported to the Council; and immediate notice of the same, with an account of such arrear, shall be forwarded to every Fellow whose name shall have been so reported; and if the arrear be not paid within one calendar month from the date of such notice, or within such further time as the Council may grant upon special cause to them shown, the Council shall direct that the name of the Fellow so reported together with a statement of the arrear shall be suspended in the Office of the Society; and if the arrear shall not have been discharged before the second Ordinary General Meeting after such suspension, the Council shall be empowered to remove the Fellow from the Society; and the name of the Fellow which has been so suspended shall not be taken down until the arrear shall have been paid, or the Fellow shall have been removed from the Society.

4. The names of defaulters whose subscriptions are more than 3 years in arrear shall be struck off the list as Fellows.

Chapter V.

MEETINGS OF THE SOCIETY.

The Meetings of the Society are of three kinds, Anniversary, Special, and Ordinary.

Sect. 1.—*Anniversary Meetings.*

1. The Anniversary Meeting of the Fellows shall be held on the fourth Monday in May.

2. Notice of this Meeting shall be sent to every Fellow residing in the United Kingdom, whose address is known; and shall be inserted in two or more newspapers, one week at least before the day of Meeting.

3. The object of this Meeting shall be to elect the Council and Officers for the ensuing year; to receive the Annual Report of the Council, and to hear the President's Address. And no new regulation, nor alteration or repeal of any existing regulation, shall be made at such Meeting, unless unanimously proposed by the Council.

4. The Annual Report of the Council shall be read to the Society before commencing the ballot.

5. The Society being required to make certain annual changes, as before specified, in the Council, a sufficient number of printed balloting lists, according to the form No. 2 in the Appendix, shall be prepared by the Assistant Secretary previously to the Meeting; one column of which shall contain a list of the existing Council; a second, the names of the Fellows proposed to be changed, as well as those who retire in rotation; a third, of those proposed to be elected in their stead; and a fourth left vacant to receive the names of any other Fellows not so proposed, whose names individual Fellows may wish to substitute for those specified in column 3.

One of these balloting lists shall be given at the Meeting to every Fellow present.

6. The chair shall be taken at one o'clock P.M., or as soon after as twenty-five Fellows shall be present; whereupon, the Regulations relating to the Anniversary General Meetings being first read, the Chairman shall appoint two or more Scrutineers from among the Fellows present, to superintend the ballot during its progress, and, when it is closed, to examine the lists, and report the result to the Meeting.

7. Each Fellow voting shall deliver his balloting list, folded up, to one of the Scrutineers, who shall immediately put it into the balloting-box.

8. The ballot shall close when two hours shall have elapsed from taking the chair. The Scrutineers shall then report the number of votes for each person to the Chairman, who shall declare the persons on whom the election has fallen.

Sect. 2.—Special General Meetings.

1. The Council may at any time call a Special General Meeting of the Society, whenever it shall be considered necessary.

2. Any six Fellows may propose to the Council any new regulation, or the alteration or repeal of any existing regulation, by letter addressed to the Secretaries; and if dissatisfied with the answer of the Council, they may require that their proposition be referred to a Special General Meeting, which the Council shall convene for that purpose within one month after receiving such requisition.

3. A week's notice at least of the time when, and the object for which, every Special Meeting is to be holden, shall be sent to every Fellow residing in the United Kingdom. And no other business than that of which notice has been thus given shall be entered upon or discussed at such Meeting.

4. A Special General Meeting, convened as herein provided, may be holden on any one of the days appointed for the Ordinary General Meetings; in which case the Special business shall be entered upon immediately after the ordinary business of the day is closed.

5. Not fewer than twenty-five Fellows must be present to constitute a Special General Meeting.

Sect. 3.—*Ordinary Meetings of the Society.*

1. The Ordinary Meetings shall be held on the evenings of the second and fourth Monday of every month; or oftener, if judged expedient by the Council. The Chair shall be taken precisely at half-past eight o'clock.

2. Visitors, if introduced by Fellows, may be present at the Ordinary Meetings; but such privilege of introducing Visitors shall be limited to *one* only for each Fellow.

3. No visitor, excepting those PERSONALLY introduced by Fellows, or by a Council Card, can be admitted to the Room before the Chair shall have been taken.

4. At the Ordinary Meetings, the order of proceeding shall be as follows:—

A. Permission to be asked for the presence of visitors.

B. The minutes of the last Meeting to be read, and, if their accuracy be not questioned by the Meeting, to be signed by the President or Chairman.

C. The presents made to the Society since their last Meeting to be announced, and thanks ordered to be returned.

D. New Fellows to be introduced to the President or Chairman for admission into the Society; result of Ballot of Candidates to be announced; and recommendations of other Candidates to be read.

E. Papers and communications to be read and discussed.

5. At the Ordinary Meetings of the Society nothing relating to its regulations or management shall be brought forward. But the Minute-Book of the Council shall be on the table at each Meeting; and extracts therefrom may be read to the Meeting on the requisition of any Fellow.

Chapter VI.

COUNCIL AND OFFICERS OF THE SOCIETY.

Sect. 1.—*Council.*

1. The government of the Society, and the management of all its concerns, are entrusted to the Council, subject to the Regulations of the Society.

2. The President, any one of the Vice-Presidents, or any three Members of the Council, may at any time call a Meeting of the Council; and when such Meeting is to be held, every Member of the Council residing in the United Kingdom shall be summoned by letter.

3. In all Meetings of the Council, five shall be a quorum; and all questions shall be decided by vote, unless a ballot be demanded. Any determination of the Council, whether by vote or ballot, shall, at the desire of any two Fellows present, be deferred to the succeeding Meeting.

4. Minutes of the Proceedings of every Meeting of the Council shall be taken during their progress in a rough book by one of the Secretaries, or, in case of their absence, by some Fellow present, whom the President or Chairman shall appoint for the occasion; and shall be afterwards copied into a fair Minute-Book to be kept for that purpose, and read, and signed by the President or Chairman at the next Meeting of the Council.

5. The Accounts of the Society shall be from time to time examined by the Council, who shall present, and cause to be read to the Anniversary Meeting, a complete statement thereof, together with a report on the general affairs of the Society during the preceding year.

6. The Council may refer particular subjects to Committees, to be named by the President or Chairman; and such Committee shall report to the Council the result of their proceedings.

7. The Council may appoint persons, not being Members of the Council, to be salaried Officers, Clerks, or Servants, for carrying on the necessary concerns of the Society; and may define the duties to be performed by them respectively; and may allow to them respectively such salaries, gratuities, and privileges, as to them, the Council, may seem proper; and may suspend or discharge any Officer, Clerk, or Servant from office, whenever there shall seem to them occasion for so doing.

8. There shall also be five permanent working Committees of Council, under the following heads, named by the President or Chairman, (with power on special occasions to add to their number)—1st, Regulations and Bye Laws. 2nd, Finance and House. 3rd, Library, Maps, &c. 4th, Publications. 5th, Expeditions.

Sect. 2.—*President.*

1. The President is Chairman of the Council, and of all Meetings of the Fellows, whether ordinary or Special.

2. It is his duty to execute, and cause to be executed, the Regulations of the Society; to see that all the Officers of the Society, and Members of the Council and of Committees, perform the duties assigned to, or undertaken by, them respectively; to call for Reports and Accounts from Committees and persons; to cause of his own authority, and when necessary, Special Meetings of the Council and of Committees to be summoned; and to propose, from time to time, to the Council such measures as shall appear to him conducive to the welfare of the Society.

3. As Chairman of the Council he shall appoint Referees to examine and report on original Papers communicated to the Society, previous to their publication.

4. It is his duty, conjointly with the Council, to consider and resolve on the names of Fellows who are to go out of the Council, and of those to be recommended to the Anniversary Meeting to fill up the vacancies.

5. When prevented from being present at the meetings of the Fellows or Council, or from otherwise attending to the

current business of the Society, he will be expected to give timely notice thereof to one of the Vice-Presidents, or, in their absence, to some other Member of the Council, in order that his place may be properly supplied.

6. In all Meetings of the Society and Council, except in the cases otherwise provided for, the decision of a majority of the Fellows voting shall be considered as the decision of the Meeting, the President or Chairman having only a casting vote.

Sect. 3.—*Vice-Presidents.*

One of the Vice-Presidents shall supply the place of the President when absent. And twice, or oftener, in every season, he shall examine, in detail, the state of the household; the Assistant Secretary's department; and the amount of care displayed in keeping the official Books, and the Library, including Maps, Drawings, and Instruments.

Sect. 4.—*Treasurer.*

1. The Treasurer is *ex-officio* one of the Trustees of the Society; and the Funds of the Society shall be vested in his name, and in those of the two other Trustees.

2. The Treasurer has special charge of all Accounts; and shall see to the collecting of all sums of money due to the Society.

3. He shall, of his own authority, appoint a Collector, for whom he shall be responsible, and who shall receive a reasonable remuneration; and the money collected shall immediately be paid to the Bankers of the Society.

4. In concert with the Secretaries, the Treasurer shall keep a complete List of the Fellows of the Society, with the name and address of each accurately set forth; which List, with the other Books of Account, shall be laid on the table at every Ordinary Meeting of the Council.

5. He shall also pay all accounts due by the Society, as soon as they have been examined and approved by the Council. But no drafts on its Bankers shall be payable

unless signed by three of the Council; and the Accounts of the Treasurer shall be annually audited by two Fellows, one selected from the General body of the Fellows, and one from the Council, proposed by the President, or Chairman, and approved by the first Ordinary Meeting held in the Month of February.

Sect. 5.—Secretaries.

I. The two Secretaries of the Society, and the Foreign Secretary, Members of the Council, shall be Honorary Secretaries; and there shall be an Assistant Secretary, a salaried Officer, appointed by the Council.

It shall be the duty of the Secretaries,—

1st. To conduct the correspondence of the Society and Council, by writing, or causing to be written, such letters as may from time to time be requisite.

2nd. To attend the General Meetings of the Fellows, and at the Meetings of the Council; to write Minutes of the proceedings during their progress; and at the commencement of every subsequent Meeting to read the Minutes of the previous Meeting from the original Minute-book, the clean transcript of which shall be laid before the President, who will see that each Minute is accurately transcribed before he affixes his signature.

3rd. At the ordinary Meetings of the Fellows, to announce the Books or Maps presented to the Society since their last Meeting; to read the Certificates of Candidates for admission into the Society, as well as the Papers communicated to the Society, which have been directed by the Council to be read.

4th. To see that all such Minutes and Abstracts of Proceedings are correctly entered in the several Minute-Books before the following Meeting; and that all such other writings are duly made by the chief or other clerks, as the service of the Society may require.

5th. To have charge of the Scientific Instruments belonging to the Society, advising as to their purchase, use, and management; and, under the direction of the Council, to frame suggestions for Explorers of Foreign Lands.

6th. To have the immediate superintendence of all persons employed by the Society; to take charge of all its Books and Maps, and see that the same are properly arranged and catalogued.

7th. The Secretaries, as well as the President and Vice-Presidents, shall, by virtue of their offices, be members of all Committees appointed by the Council.

Foreign Secretary.

It shall be the duty of the Foreign Secretary to conduct the correspondence of the Society or Council with Foreign Societies, or with persons resident abroad, and generally to obtain an acquaintance as to the progress of geography in other countries.

Assistant Secretary.

The duties of the Assistant Secretary shall be to edit the Journal and Proceedings of the Society; to prepare all such abstracts, analyses, or notices of geographical papers or books as may be required by the President or Secretaries; to translate or bring under notice of the President and Council articles in foreign journals and proceedings relating to the science of Geography.

The Assistant Secretary shall be a salaried Officer, resident at the Society's apartments; to have supervision, under the Secretaries, of the Books, Maps, Instruments, and other property of the Society on the premises; and to exercise a general supervision over all the officers and servants, and to see that their duties are punctually executed.

APPENDIX.

No. I. — FORM OF CANDIDATE'S CERTIFICATE.

CERTIFICATE OF CANDIDATE FOR ELECTION.

Name _____

Title _____

Residence _____

being desirous of admission into the ROYAL GEOGRAPHICAL SOCIETY, We, the undersigned, recommend him as likely to become a useful and valuable Fellow.

Dated this _____ day of _____ 186 .

_____ } *From personal knowledge.*

_____ F.R.G.S.

_____ F.R.G.S.

Proposed _____ 186 .

Elected _____ 186 .

No. II.—FORM OF BALLOTING LIST.

ROYAL GEOGRAPHICAL SOCIETY. BALLOTING LIST FOR THE COUNCIL.

Offices.	Present Council.	Fellows changing office or going out of the Council.	List proposed for election by the Council. (The names in *italics* are those of the new Councillors, and those who change office.)	Names proposed by any dissentient Fellow.

No. III.—FORM OF BEQUEST.

Those persons who are inclined to benefit the Society by Legacies are recommended to adopt the following

FORM OF BEQUEST.

Item.—I bequeath the sum of £ out of my pure personal estate (or £ , part of my Consolidated Bank Annuities or my Shares) to the Royal Geographical Society.

N.B. All gifts by will to the Society of land, or of money, secured on, or directed to be secured on, or to arise from the sale of, or directed to be laid out in the purchase of land, will be void. Gifts may be made by will of Stocks in the Funds, shares in companies, or money to be paid out of the testator's pure personal estate or of personal chattels.

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